CHEMICAL LIBRARY

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Pharmacists Owe It to the Public to Convince Legislators That the Sale and Dispensing of Medicines Be Restricted to Those Qualified by Education and Training. There Is a Tendency in Some Sections to Destroy the Protection Afforded the Public Which Demands Prompt Attention.

Vol. XXII, No. 2 FEBRUARY, 1933

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

TRADE MARK

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THE 81st ANNUAL MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION WILL BE HELD IN MADISON, WISCONSIN, AUGUST 28 TO SEPTEMBER 2, 1933, HOTEL LORAINE, HEADQUARTERS, EMERSON STANLEY, 602 CENTRAL BUILDING, MADISON, LOCAL SECRETARY.

The 1933 Meetings of the American Association of Colleges of Pharmacy, the National Association of Boards of Pharmacy, Conference of Pharmaceutical Association Secretaries, of the Pharmaceutical Law Enforcement Officials and the Plant Science Seminar will also be held in Madison.

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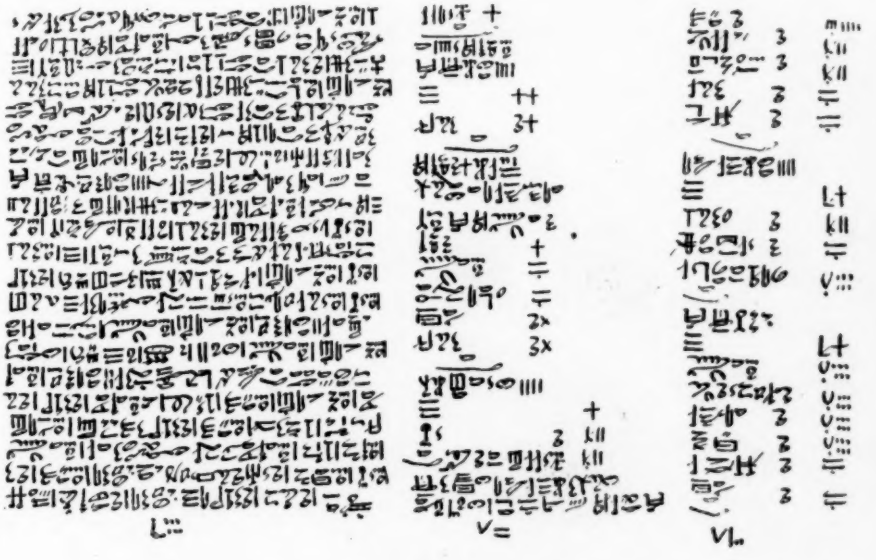
PHARMACY OF MANY CENTURIES IN THE CENTURY OF PROGRESS.

(See page 1, January, where reference is made to "Ebers Papyrus.")



The inscriptions above are three folios from the Ebers Papyrus which include eighteen prescriptions and according to George Ebers are as follows:

Left.—Three recipes for treating diarrhea, including grapes, honey, onions, figs, green lead (?) dough, flour, white of egg (?). The weights of the separate ingredients are given in left-hand column since the hieratic script reads from right to left.

Center.—Four recipes for expelling worms. No. 1 (begins line 3) reads: "Cyperus tuber 1/32, verdigris 1/32, water 1/3, boil and take four days." Between each recipe are repeated two signs which mean "another."

Right.—This folio contains eleven recipes for diseases of the eyes, including a formula for verdigris ointment, also known as Egyptian ointment, which fills lines 2 to 6 (from top). The ingredients are: Sa-seeds of Upper Egypt (saltpetre), red lead, verdigris and honey, equal parts. This ointment is recommended in the treatment of conjunctival catarrh with swelling.—From George Ebers, "The Ebers Papyrus," 1873—through "Sixty Centuries of Health and Physic."

F. GLADSTONE HINES.

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

VOL. XXII FEBRUARY, 1933 No. 2

F. GLADSTONE HINES.

F. Gladstone Hines, president of the Pharmaceutical Society of Great Britain, was elected *honorary member* of the AMERICAN PHARMACEUTICAL ASSOCIATION at the Toronto meeting.

Mr. Hines passed the qualifying examination in Pharmacy in 1902, and after a brief experience with a manufacturing firm engaged in the retail business on his own account, and still has extensive retail interests, and is a director of Grimwade, Ridley & Co. (Ipswich), Ltd., a wholesale and manufacturing house. Prior to his election as president he was vice-president, and there stands to his credit a fruitful record of service to British Pharmacy as a member of the Council. In that capacity he has done much valuable work on the Education, Finance, Publications and Law committees; as a speaker and debater at Council meetings and as an active and effective platform exponent of the work and policy of the Council.

Our honorary member participated in the work of the Sections, Conferences, House of Delegates and General Sessions and social functions of the Toronto meeting. He made many friends among the members who hope for a return visit by him and his confrères. The *Pharmaceutical Journal and Pharmacist*,[1] official organ of the British Pharmaceutical Society, after his election as president wrote of him as follows:

"MR. GLADSTONE HINES, the newly elected president, is a man of many talents and achievements in pharmaceutical business, practice and politics, and also in public life, who throughout his career has proved himself to be a personal force in all the spheres in which he has moved and energized. In York, where until recently he was in retail business, he played a prominent part in pharmaceutical and civic public life. During that period he was secretary of the local association of pharmacists and of the Pharmaceutical Committee, and was for fifteen years a member of the York Borough Insurance Committee, rendering valuable service on the Medical Benefit Sub-Committee and also as chairman of the North of

[1] June 4, 1932, page 460.

England Joint Insurance (Prescriptions) Committee of Durham, and he is a former vice-president of the York Centre of the Faculty of Insurance. At the General Election in 1929 he was the approved pharmacist (Liberal) candidate for the Loughborough Division of Leceistershire, and although unsuccessful, did so well that his chances were good enough to have warranted a second candidate at the General Election last year, but for patriotic reasons Mr. Hines decided not to stand.

"Since entering the Council in 1917 he has shown himself to be one of the most alert, active and influential members, forward-thinking and forthright in his views and action as to all the current problems and issues affecting the rights and claims of the Society and pharmacists generally, and during his two terms as vice-president he has devotedly, diligently and with conspicuous ability discharged all the duties devolving upon him. This record of achievement and service is in itself a sufficient credential and guarantee for his continued success in the new office to which he has been called."

NATIONAL CONFERENCE ON PHARMACEUTICAL RESEARCH FELLOWSHIP.

The National Conference on Pharmaceutical Research announces its second fellowship.

1. *The name of this fellowship* is "The Fellowship of the National Conference on Pharmaceutical Research." The amount of this fellowship is five hundred dollars ($500.00).

2. *Qualifications of the Recipient:* The recipient must hold a bachelor's degree from a recognized school of pharmacy.

3. *Basis of Award:* The fellowship will be awarded for high scholastic attainment and for research ability as evidenced by research completed or conducted and published, or intended for publication.

4. *How the Fellowship Shall Be Awarded:* The fellowship shall be awarded at the discretion of a committee of the National Conference on Pharmaceutical Research. This committee is composed of the chairman, secretary, treasurer and two other members elected by the Executive Committee. Notice of the meeting of this committee for consideration of the award shall be given to the deans of recognized schools of pharmacy, advising them to notify the graduate students, and also the pharmaceutical press at least three months prior to the annual meeting of the National Conference on Pharmaceutical Research. The award shall be made at the last general session of the AMERICAN PHARMACEUTICAL ASSOCIATION.

5. *Purpose of the Award:* The purpose of this fellowship is to establish under the direction of the pharmaceutical faculty a ten months' scholarship in a graduate school, awarding a doctor's degree that is recognized by the graduate faculty of the university or other generally accepted academic evaluating agencies.

6. *Disposition of Research:* The research conducted under this fellowship shall be presented after completion to a recognized pharmaceutical journal for publication.

For further details regarding the awarding of this fellowship, applicants are advised to address the Secretary of the National Conference on Pharmaceutical Research—John C. Krantz, Jr., 2411 North Charles Street, Baltimore, Maryland.

January 23, 1933.

"The keynote of any profession should be public service. It is true that we have a few lines coinciding with our ethical and professional outlook, but how little is done by one pharmacist for another, by master for assistant or apprentice or for the general public! Pharmacy must stand or fall on its capacity for public service, or relinquish the professional element to public institutions for dispensing and for healing of the sick."—"The Philistine" in *Australasian Journal of Pharmacy.*

EDITORIAL

E. G. EBERLE, EDITOR 10 West Chase Street, BALTIMORE, MD.

PAPYRI AND PHARMACY.

THE Rosetta Stone[1] has made the reading of the ancient Egyptian papyri[2] possible, however, there are many difficulties that translators meet with in their efforts to decipher the characters of the ancient writings, and disclose their meaning to present-day minds. The Hieratic was not inscribed on the Rosetta Stone, so it was necessary first to translate the Hieratic of the papyrus. It is readily understood that successful interpreters must study the periods of the inscriptions, knowing that the development of knowledge, the viewpoints of the people, their habits and customs, may give different meanings to the characters—as a result, there is a difference of valuation of authority and opinion, based on comprehensiveness of study.

G. Elliot Smith in commenting on the monograph of Prof. James Henry Breasted[3] says: "Professor Breasted's is the most ambitious attempt that has ever been made to interpret an ancient medical treatise, for he has summoned to his aid all the resources of Egyptian philology meaning underlying the cryptic phraseology. He has provided all the material on the Egyptian side so that the way is now ready to institute comparisons with Hebrew and Greek Literature, and, using the technique of Professor Yahouda's method, bring illumination to the writings of these three ancient peoples, to whom in different ways our own civilization is so deeply interested." In Nehemiah there is mention of "Hananiah, the son of the Apothecary;" in Exodus directions are given for an "annointing oil to be compounded after the art of the apothecary." The Egyptians possessed books on drugs and preparations of them in the first half of the fourth millenium, B. C. and, according to Sir E. A. Wallis Budge, Anepu, whom the Greeks called Anubis, may be regarded as the apothecary of the gods of Egypt.

Some of the papyri contain references and parts of much earlier writings; this is especially true of "Ebers Papyrus." The earliest known papyrus of medical interest was discovered at Kahun in 1889 near the pyramid of Illahun. Ebers believed he had discovered No. 40 of the Hermetic Books—The Book of Remedies, but Joachim, eminent authority, denies this; however, he says of Ebers Papyrus: "It surpasses in importance all other medical papyri in the richness of its contents and its completeness and perfection. It is the largest, the most beautifully written and best preserved of all the medical papyri." Other medical papyri are: The Edwin Smith, Hearst, Lesser Berlin, Berlin and London. In these folios are records of drugs and preparations, many of which still find application and use.

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[1] The Rosetta Stone was found at the Rosetta mouth of the Nile. It is a piece of basalt and contains part of three equivalent inscriptions—the highest in hieroglyphics, second in demotic characters and third in Greek. The stone was erected in honor of Ptolemy Epiphanes, March 27, 196 B. C. In its present broken condition it is 3 feet, 9 inches high; 2 feet, 4½ inches wide; 11 inches thick.

[2] See address of L. E. Warren in October JOURNAL (October 1931), page 1065.

[3] It will interest readers to know that Professor Breasted was a pharmacist in his earlier years and is a graduate of the University of Illinois School of Pharmacy (Chicago College of Pharmacy). Our fellow-member, Sir Henry S. Wellcome, is well and favorably known in archæological discoveries, searches and promotions.

This comment is prompted by the mention in the January JOURNAL of the "Ebers Papyrus" in connection with the pharmacy exhibit at the Chicago World's Fair—"A Century of Progress." The history of pharmacy is written into that of the Commerce and Industry of every period, and the importance of drugs has a place closely linked with foods. The study of the crude products and their preparations into materia medica have had a part and contributed to the development of literature, the sciences and arts. It is evident that no division of the Exhibits offers greater opportunities for enlisting interest of the visitors and making them acquainted with pharmacy's part in the world's progress, not only of the Century, but of the ages.

THE RESTRICTION OF THE SALE OF MEDICINES TO THOSE QUALIFIED BY EDUCATION AND TRAINING.

EVERY period has problems which must be solved or conformed to the best interests of the public. Times like the present, and probably there have been no experiences like those now prevailing, bring to the fore a realization of conditions which have not heretofore been disturbing factors.

Dr. Walter F. Taylor, writing in the *Scientific Monthly*, said: "The intellectual worker, as well as the public, has a definite responsibility for the condition under which he works." Charles G. Merrell made the following statement: "No organization or business will be of real value to the community interests that it is intended to serve unless there be born into it ideals and purposes that are not only beneficial to the drug trade but to our national life as well."

In order to be helpful, coöperation must come from within the ranks; each division of the drug-trade activities has its peculiar problems, but there are certain efforts in which all the divisions can have a part and be mutually helpful. Indecision and working at cross purposes develop weakness of which other groups take advantage for promoting their own interests. When the paramount thought is service, there is no influence for pharmacy more potent and powerful in the accomplishment of good than that of the business and professional men unselfishly banded together for the purpose of promoting the general welfare of pharmacy, and the shaping of these activities is not only responsive to our energies and ideals, but depends on how we impress the public with our coöperative efforts.

The public has no clear appreciation of the fundamentally important rôle of pharmacy included in the drug-trade activities and, as a consequence, is not as deeply concerned about pharmacy as it should be, feeling that when the individual needs the important service of a pharmacist there is near at hand a pharmacy—but will this protection be afforded him, if he is unwilling to do his part and give support during interims he considers less important? This indifference and attitude come into evidence at times and exhibit lack of thought of the fact that progress in the development of pharmacy is dependent on encouragement by the public to uphold professional ideals which may be more important in the service than conveniences and price.

Side-lines in drug stores have been augmented largely because of the fact that "the American citizen wants what he wants and when he wants it." Having brought this about there is in some sections an implied purpose to further place con-

venience above safety by permitting the sale of some drugs and preparations, under certain forms of packaging, in establishments where the salespeople are not qualified by education and training to dispense medicines, and without this knowledge there is not the realization of responsibility which comes with proper pharmaceutical training and education.

The reason for the existence of pharmacy is the service to man and under conditions when he needs protection. As good citizens it becomes the duty of pharmacists and their organizations to strengthen a rational understanding in the minds of the people of the full meaning of not only the preparation but handling of medicines and the knowledge which is essential for those so engaged. Coöperation must come from within the ranks.

In concluding this comment liberty is taken in quoting from a timely message by Robert L. Swain:

"They (pharmacists) should be made vividly aware of their importance in the proper development of the profession. They should consider themselves the visible representation of the hopes and aspirations of the calling. They should be made to see that the future value and security of the profession depend, in a very great degree, upon that public attitude which they themselves fashion and control. This does not mean, and is not meant to mean, that pharmacists should divorce themselves from the commercial activities of the drug store. A sound conception of the purpose of pharmacy would at once mark such a suggestion as destructive to the best interests of the profession and that public which it serves. These thoughts do mean, however, that every drug store should be first of all a drug store; and devoted to the fundamental and essential service which pharmacy renders, and this should be the dominant consideration. This simply means that the profession must be firmly committed to the policy that the truly pharmaceutical phase of the store should be kept uppermost. The public must be made to see, through the instrumentality of the pharmacist himself, that the drug store rests upon a dignified professional foundation. Furthermore, the public should be made to appreciate that from this professional background springs the essential and responsible service which is called upon to attain and maintain in a large measure the public health of the state."

PHARMACY AS A CAREER.*

LEAFLET No. 14—"Pharmacy as a Career"[1] is one of a series devoted to a discussion of the professions as a career. It covers the following subjects: Definition and brief history of pharmacy, standards, functions, qualifications, opportunities, women in pharmacy, salaries, census, state requirements, registration, state board examinations, the schools and colleges, degrees, student expenses, closing with a table of schools and colleges showing for each the total expenee, enrollment and degrees awarded in 1932. The leaflet is written in a somewhat popular style and by one who knows from experience what the student, the student

* From A. PH. A. *Bulletin*, January 20, 1933.

[1] The Office of Education of the U. S. Department of the Interior has recently issued a revision of the above leaflet based on the four-year course in pharmacy and it may be obtained from the Superintendent of Documents, Washington, D. C., at 5 cents per copy with a reduction of 25% in quantities.

adviser and others wish to know about pharmacy as a career. It is serviceable in making legislators and laymen acquainted with pharmacy, that medicines should not be handled as merchandise and that those engaged in the practice should be qualified by education and training.

The inclusion of a leaflet on our profession in this Career Series by the Office of Education is a further recognition of pharmacy by the Government, and the following quotations taken from it are both encouraging and significant:

"As the educational requirements for entering the profession of pharmacy have increased there has been a corresponding recognition on the part of the Government of the professional qualifications of pharmacists."

"To-day pharmacy is recognized as a public-health profession in every civilized nation of the world, and its practice in each is regulated by law. Its development as a public-health profession in this country includes advances in pharmaceutical education and training; in the legal registration and licensing of pharmacists by the States; in legislation (1) for limiting the practice of pharmacy to those licensed, (2) for regulating the distribution of poisons, narcotics and alcoholic liquors, and (3) for controlling the quality and purity of drugs and medicines; in the establishment of national and state agencies for the enforcement of such legislation for the protection of the public; and in the stimulation of research to develop new drugs and to improve standards."

COST OF MEDICAL CARE.

BY RAY LYMAN WILBUR.
Secretary of Interior.

The great problem of the cost of medical care brings more and more into focus the question of the Federal Government's relationship to medicine. One of the first suggestions brought forward is that the Federal Government should provide medical care to all citizens.

In many parts of the world this is the answer that has been given. In this country the extension of Government medical service to veterans and their families and the care of nonservice-connected disabilities has been a recent and a serious phenomenon.

Nevertheless in spite of the vast concentrations of power and authority now in Washington and the growing and dangerous tendency of the people to turn to the Capitol for all necessary reforms, we have retained in America a healthy local responsibility and control over two important functions—education and medical service. In so far as these functions are supported by taxes, the funds are assessed, collected and disbursed locally.

With no central authority attempting to enforce uniformity of action upon all parts of the country, we can try out a great variety of plans. If State action is necessary, we have 48 laboratories in which to find out what action is most effective; if city or county action is called for, we have several thousand experiment stations.

We have no tradition that impels us to consider personal health matters as a Federal concern. We have no need of ever tying ourselves hard and fast to any one type of proposal.

In health, as in education, we should keep sharply in focus the primary function of the Federal Government as one of research and the dissemination of information. Its function here is not administration—Through *U. S. Daily*.

DRUGGIST LEGIONNAIRES.

Chicago Retail Druggists' Post No. 575, American Legion, whose membership is composed exclusively of pharmacists, and most of them members of the Chicago Retail Druggists' Association, solicits and invites correspondence with other similar Posts, if there be such. Or, Posts whose membership is largely composed of pharmacists and members of any related professions.

We would like to interchange ideas and welfare practices, to the end that we may function more usefully in our respective communities.

Our headquarters are the same as that of the C. R. D. A., Room 820, 32 W. Randolph St., Chicago, Illinois.

(*Signed*) MAURICE SICKEL, *Commander*.

SCIENTIFIC SECTION

BOARD OF REVIEW ON PAPERS.—*Chairman*, L. W. Rowe; John C. Krantz, Jr.; F. J. Bacon.

ON A LABORATORY TEST FOR LIVER EXTRACT.*

BY C. W. EDMUNDS, HAROLD H. BRUECKNER AND AGNES I. FRITZELL.

Among the therapeutic agents which have been introduced into the practice of medicine in the past few years probably none have aroused greater interest than liver and stomach preparations for the treatment of certain anemias. It may also be said that no agents probably ever demonstrated their value to the medical world so rapidly as did these. In a few brief weeks the results described by their discoverers were confirmed by reports emanating from all parts of the medical world; and liver extract and desiccated stomach were placed upon a firm foundation as valuable medicinal agents.

Following the introduction of a liver diet and the recognition of its limitations, efforts were made to isolate the active substance from the liver which was responsible for the clinical improvement and very soon various fractions and extracts were obtained which would produce the same favorable effects that follow the administration of whole liver or stomach. However, in the preparation of these different extracts it was recognized at once that it was necessary to determine their potency—to see whether the individual fraction still possessed the essential action of the liver or whether in the course of preparation it had been lost. It is here that difficulty has arisen as no laboratory method has been discovered which will show whether such extracts will produce the same effects as follow their administration to patients with pernicious anemia. Nor indeed has any other criterion been described in any of the common experimental animals, with possibly one exception, which would seem to serve as an index of potency. The only alternative has been, therefore, to test the activity of these extracts by administering them to patients who are suffering from pernicious anemia. The administration of a potent extract to a suitable patient is followed in due course by an increase in the number of reticulocytes in the blood, by an increase in the number of red blood cells and in hemoglobin, and by clinical improvement. Failure of these signs to appear denotes an extract or fraction without potency.

The difficulties with this method of evaluation are manifest. Not only are patients with this ailment not plentiful but on account of the wide publicity of the value of liver most of the individuals so affected have been taking liver or stomach in some form or other and so are not available for use unless they are in a state of relapse. Then, too, the other side of the question has to be considered; namely, whether it is ethical to administer to a patient with this disease a preparation the potency of which is not known. This latter objection is not a serious one, perhaps, as a delay of a few days is not important in most patients and the benefits to be derived from such tests are so conspicuous and cannot be gained in any other way that the method is entirely justifiable. However, it was in an effort to avoid these difficulties and to try to find a method of laboratory assay that the present study was undertaken.

* From the Laboratory of Pharmacology of the University of Michigan, Ann Arbor.

A survey of the literature shows that many attempts have been made to study the action of liver preparations upon the lower animals and certain effects have been described as following their administration. But in only one instance have these effects been of such a character that they would seem to offer any hope that they could be used for the commercial testing of such products. In 1930, Vaughan, Muller and Zetzel (1) published a paper on the effect of the administration of various liver preparations upon the blood of pigeons. They report in this paper that if preparations which have been shown to be potent by clinical tests are administered to pigeons, their use will be followed by an increased number of reticulocytes in the circulating blood and by an increase in the weight of the birds. These facts, shorn of all details, seemed to offer a hope that the method might be adapted for the testing of preparations in the laboratory and thus to avoid the use of patients for the purpose. Opposed to this idea was the fact that other workers have tried to confirm the findings reported but have failed to do so. However, the importance of the matter seemed to justify further study. Furthermore, it appeared to be an unusually favorable opportunity to carry out such an investigation as we had available for advice and consultation Drs. Sturgis and Isaacs of the Simpson Memorial Institute for Medical Research, and in addition had for study various preparations of liver and stomach which had been used in the Institute and their potency thus determined.

The pigeons we used were derived from two sources. Some were from the Genetics laboratory of the University where these birds have been used for experimental purposes for years so that they had been raised in captivity, as indeed their ancestors had been before them. They were accordingly grain-fed ("Globe pigeon feed"). When this source failed we secured others from a dealer who raised them for the market. Thus they, too, had been raised in captivity and were grain-fed. The blood from the members of the two groups did not show any essential differences.

In regard to the number of reticulocytes in the blood of pigeons Vaughan and her coworkers direct that the pigeons be fed upon grain for some weeks until they show about 10% of reticulocytes in the blood and in any case not over 12%. These figures we have been unable to duplicate. In our pigeons born and bred in captivity we have never found one with a count as low as 10%. Some had 15–17% but most had about 20% and some even as high as 40%. It is probably true that pigeons with only 10% reticulocytes might be preferable for the work but all our birds had higher percentages. This discrepancy may possibly be explained by the method of counting and classification. We used for the purpose of staining the usual alcoholic solution of brilliant cresyl blue which is spread upon cover slips and allowed to dry. A small drop of blood is then spread upon the cover and when the film is dry it is counterstained with Wright's stain. There are in the pigeon's blood what for our purposes may be freely classified as two groups of cells containing reticular material. One group stains very heavily and contains large granules and a marked network giving the cell a dark color. These cells are very noticeable when the film is examined under the microscope. Then there are other cells with smaller amounts of reticular material, some in which it is quite apparent while in others the amount is small, requiring careful focusing. These, too, have been considered reticulocytes—that is, any cells which contain

any granular material were counted as reticulocytes—just as in clinical work. The number of the heavily reticulated cells was usually about 15% and in the fluctuations which occurred from count to count the curve of these cells usually ran parallel to the curve of the total number of reticulocytes in the blood.

Gain in Body Weight.—All the pigeons were weighed during the period they were under observation but the results show that there was no characteristic change in either direction during the time the preparations were being administered. Some pigeons gained weight while many lost. Our results in this respect did not agree with those reported by Vaughan and her coworkers. In their work the administration of liver preparation No. 132E was usually followed by a gain, but with the other preparations gains were exceptional although no losses in weight were reported. We found many which lost weight.

Our general plan of procedure was as follows: The birds were weighed and the blood vessels under one of the wings were exposed by the removal of a few feathers. The vein was then pricked with a surgical needle so as to give a free flow of blood. Small drops were taken and four or five spreads made as described and the liver or stomach preparation to be tested was then administered. In most cases it was injected into the breast muscle where it never seemed to produce any local irritation. In a few cases we injected the material intravenously but this did not seem to offer any advantage to compensate for the extra trouble. Some of the fluid preparations we gave by mouth with a medicine dropper or they were introduced into the crop by means of a small catheter. One desiccated stomach preparation was given in capsules but for the usual fluid preparations the intramuscular route seemed to be the method of choice.

The time when the reticulocyte increase is to be expected is a matter of considerable importance and according to our experience is subject to considerable variation. Vaughan says it is between the third and the eighth day. It is doubtless true that the increase may begin on the fourth or fifth day but after a considerable experience we finally decided on the eighth or tenth day as being early enough to make the count and as being fairly certain to show any increase which might have resulted. Subsequent counts were made at intervals of from five days to a week until about the twentieth day after the injections were begun. In our work all the counts were made by one person (B.) so that they are all strictly comparable.

The preparations studied were from various sources. Some came from material which was being tested in the Simpson Institute while others were kindly furnished by commercial houses from stock which had all been clinically tested. Certain preparations which had been found to be of doubtful value were used as controls.

Dosage.—In an endeavor to secure some uniformity we gave each pigeon the equivalent of about 20 Gm. of liver as indicated on the containers. In only one or two instances did we deviate from this rule and give more as will be noted. The total dosage to be administered was divided into fractions to be distributed over three or four days. A dosage of 4 cc. for instance was given 1 cc. daily, using the two sides of the breast alternately for the injections. In the testing of any single preparation four pigeons were used as a minimum. In a few instances

second or even third groups of four were injected, making a total of from eight to twelve birds for a single study.

Before giving the details of our various assays it might be well to summarize briefly our results and conclusions. In general our work confirms the findings of Vaughan and her coworkers with perhaps certain qualifications. We have discussed, for instance, the discrepancy between their findings and ours in regard to the number of reticulocytes in the pigeon's blood. On the other hand we do find that approximately a week after the beginning of the administration of a potent liver preparation the recticulocytes in the vast majority of pigeons begin to increase in number. The extent of this increase and its duration differs in different birds and is doubtless also dependent upon the amount of the active substance administered. It may possibly be due to smaller dosage but the increases we found in our work were not so great as those reported by Vaughan. In some birds the increase was only 6 or 8%; in most it was between 10 and 20% and in a few it was even higher. In some birds the increase was gradual and sustained, while in others a maximum was reached to be followed by a sharp fall. In an occasional bird no increase occurred, but such findings were, however, infrequent occurrences. In a certain group one bird might fail to react while the others showed a normal increase. It would therefore be advisable when using this method for the testing of such liver or stomach preparations to employ a sufficient number of birds in order to lessen the importance of an erratic reaction.

As to what effect dosage plays we are not prepared to state at the present time. Small doses doubtless produce no appreciable increase but whether the reaction can be utilized for quantitative assays we cannot say without further study. The method apparently will differentiate a potent extract from one without action and probably a strong extract from a weak one, but whether it will go further than that only time and experience will tell. And after all, does even clinical testing of such preparations tell any more?

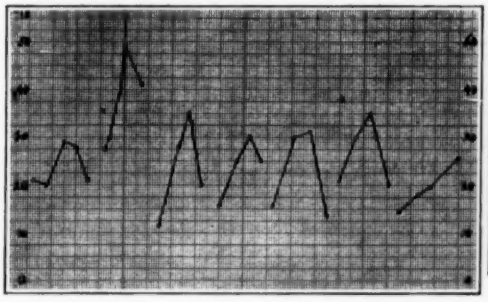
In some preliminary tests we made using this method we got very irregular results so that we seriously considered discarding the method as useless. We were using material from 50-cc. ampuls, withdrawing the small amounts as needed by means of a sterile needle and syringe. The first few injections gave promising results but later these were somewhat erratic so that we contemplated forsaking this line of the research. Just at this time a note appeared in the literature regarding the "stability" of liver extracts and it suggested to us that possibly the explanation of our poor results was to be found in changes in the extract due to frequent exposure to air or possibly to deterioration from other causes during the time over which the injections had extended. In any case we substituted material ampuled in small amounts and with this material our results have been much more encouraging.

In reporting upon our assays we are not giving the names of the firms who kindly furnished us with test material as it must be clearly understood that this is, at the present time, merely a qualitative assay to determine whether a preparation is potent or not. Because an increase in reticulocytes is greater with one preparation than with another need not necessarily mean that the former is the stronger extract. There are so many different factors involved—some of them not understood at present, others, such as the condition of the bone marrow or

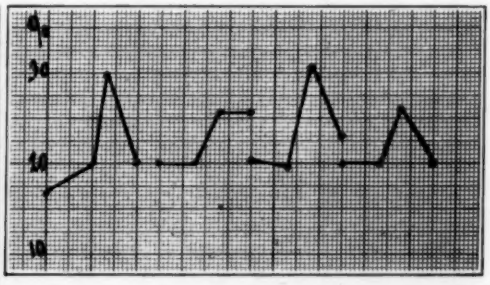
possibly a certain degree of nutritional anemia in a bird—that it would require a much more extensive study and the use of many more birds before any conclusions of a quantitative nature could be drawn. This is manifestly only a preliminary study.

Preparation No. L, Liver Ext.—1 cc. = 5 Gm. Liver. 1 cc. given intramuscularly on each of 4 days. Total equivalent—20 Gm. Liver. See composite Curve I. Average initial reticulocyte count in 7 pigeons, 18%. Average count 11th to 20th day, 34%. Increase, 88%. No increase in weight in any pigeon.

Preparation No. L2, Experiment I. Solution Liver Extract.—1 cc. = 33½ Gm. Liver. Two injections of 0.3 cc. each given = 22 Gm. Liver. See Curve II. Average initial count in 4 pigeons, 19%. Average count 13th day, 29%. Increase, 53%. Slight decrease in weight in every pigeon.



Curve I.—Percentage increase in reticulocyte counts of seven pigeons following intramuscular injection of 4 cc. liver extract.



Curve II.—Percentage increase in reticulocytes of four pigeons following two injections of 0.3 cc. each of liver extract—total 0.6 cc. = 22 Gm. liver.

Preparation No. L2, Experiment II.—Same preparation as in Experiment I but given in double the dose, total equivalent of 44 Gm. Liver in four daily injections. See Curve III. Average initial count in 4 pigeons, 25%. Average count 10th to 14th day, 30%. Increase, 20%. Preparation No. L2 was preserved with 0.5% phenol so that the birds in Experiment II were given about 7 mg. phenol and it is possible that this amount of phenol might account for the small rise in reticulocytes; considerably smaller with the equivalent of 44 Gm. of liver than with 22 Gm. On the other hand, two of the pigeons showed an increase in weight—the largest increases we had in any of our series, *viz.*, from 307 Gm. to 369 Gm. in 13 days and in the other bird from 306 Gm. to 350 Gm. in the same time. The other two birds lost slightly.

Preparation D1.—"Intramuscular." 1 cc. = 5 Gm. Liver. 4 cc. given in four daily injections. Average initial count in 8 pigeons, 22%. Average count 10th day, 26%. Increase, 18%. This preparation was interesting as with it four of the eight pigeons reacted poorly while the other four gave good percentage increases and it illustrates the necessity of using a sufficient number of birds.

Preparation D2.—"Experimental Intravenous." Total dose given 4 cc. = 20 Gm. Liver. Average initial count, 18%. Average count 9th to 16th day, 31%. Increase, 72%. No change in weight of pigeons.

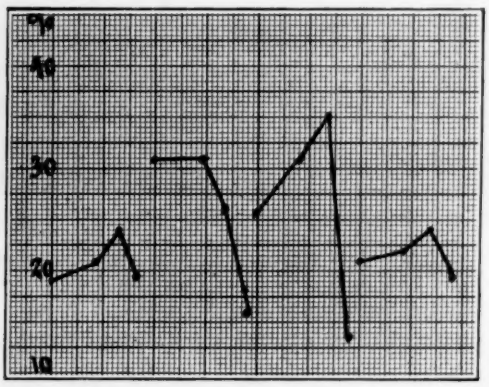
Preparation V.—"Subcutaneous liver extract made from equine livers." Total dose given 2.5 cc. = 25 Gm. Liver. Average initial reticulocyte count, 23%. Average count on 14th day, 27%. Increase, 17%.

As additional material for study and as a control Dr. Guy W. Clark, pharmacologist of the Lederle Laboratories, very kindly sent us ampuls of three lots of liver extract, as follows:

No. 56 G. being their commercial product containing 0.5% phenol and which had been tested in a clinic making a special study of pernicious anemia and reported as being fully potent. One cc. of this material was the equivalent of 33.3 Gm. liver and we gave two injections of 0.5 cc. each. Average initial count in 4 pigeons, 19%. Average count 10th to 14th day, 31%. Increase, 63%.

Preparation 57 C. was the same as 56 G. except that it contained 1% sodium chloride. The equivalent of 33.3 Gm. liver was administered as in the previous experiment. Average initial count in 4 pigeons, 19%. Average count later, 31%. Increase, 63%.

It doubtless is a coincidence but it is at least interesting that these two preparations which were identical except for the sodium chloride content give exactly the same percentage increase in reticulocytes in two groups of four pigeons each. The results obtained with these two preparations, however, are remarkably close to those obtained with another preparation received weeks earlier. In the former preparation with the equivalent of a smaller amount of liver the increase was from an initial count of 19% to 29%, while with the present preparations, 56 G. and 57 C., the increase was from 19% to 31%. Certainly it was a close agreement but one that we would dislike to have to promise to duplicate, at least at this stage of our study. It might be well to remark that these three preparations sent by Dr. Clark were examined by us (B.) as unknowns and only when the curves were completed was the key consulted.



Curve III.—Percentage increase in reticulocytes of four pigeons from same liver preparation as Curve II but given in double the dose; 1.2 cc. = 44 Gm. liver.

The third preparation sent by Dr. Clark—57 D.—was the regular product except that the filled ampuls had been heated at 75° for 15 minutes. It contained no phenol. Average initial count on 4 pigeons, 23%. Average count on the 11th day, 20%. Decrease, 13%. (Curve IV.)

The conclusion to be drawn, therefore, is that this preparation was inactivated by the heating. The reticulocytes graphs of all four pigeons were almost straight lines—no increase being found outside the limits of error and the results constitute an excellent control to the other two preparations and to the possibilities of this method of assay.

Other control tests carried out were as follows:

An extract was autoclaved at the Simpson Institute for two hours. Administered to one bird it gave on the eleventh day an increase of 2.4% and in the other a loss of 0.3%. Later, on the 14th day, both showed a slight increase, 4% in one case and 7% in the other. The results with this autoclaved preparation may be said to be practically negative. (Curve V.)

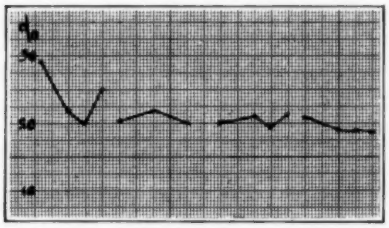
A further control was made using a dried extract which had been heated at the Simpson Institute. The equivalent of 20 Gm. of liver were given and the results were as follows:

Initial counts for the two pigeons were 22% and 19%. Ten days later the counts were 21% and 19%. (Curve VI.)

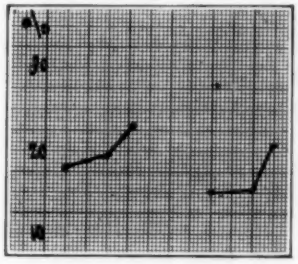
No change having taken place, this extract, too, was considered to be without potency.

Ventriculin.—This substance, the dried and powdered defatted hog's stomach, as is well known is being used extensively in the treatment of pernicious anemia.

In man, it produces the typical increase in reticulocytes in cases of such anemia and it was therefore a matter of considerable interest to see whether it would have such an action in pigeons. In addition it would serve also as a control on the method. Being an insoluble powder it was administered in capsules which the birds were allowed to swallow. Fifty mg. were placed in each capsule and each

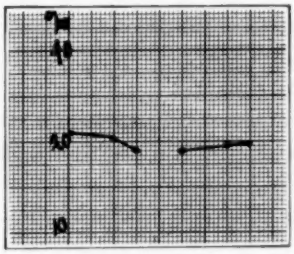


Curve IV.—Changes in reticulocyte count of four pigeons receiving a Lederle liver extract which had been heated and apparently rendered inactive.

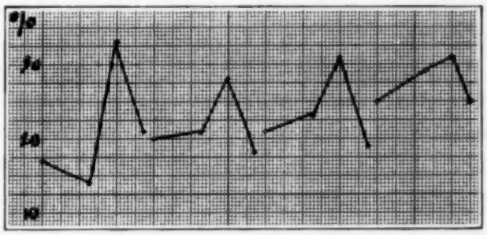


Curve V.—Percentage changes in reticulocyte count of two pigeons given a liver preparation which had been autoclaved for two hours. Very doubtful activity.

bird was given eight of these capsules on each of four days, making a total dosage of 1600 mg. In two of the pigeons the amount was doubled but the response was not greater than with the smaller dose. The result was a typical increase in num-



Curve VI.—Reticulocyte count from pigeons given a dried liver extract which had been heated and thus apparently inactivated.



Curve VII.—Increase in reticulocytes following 1.6 Gm. ventriculin given in four daily doses by mouth to each of four pigeons.

ber of reticulocytes as is shown in the composite Curve No. VII. The percentage increase was as follows:

Average initial count in 4 pigeons, 22%. Count on 10th day, 21%. Count on 16th day, 31%.

It will be seen that the increase in reticulocytes is between 40% and 50% but that it occurs considerably later than in the case of the liver preparations which could be given by intramuscular injection.

Inasmuch as the stomach wall preparation itself had given a satisfactory reticular response it was thought that possibly an extract of the stomach wall might be effective. We therefore administered to another group of pigeons a commercial aqueous-glycerin extract of the gastric mucosa of the hog presumably containing besides enzymes such organic and inorganic constituents as would result from such extraction. Being fluid it could be administered by mouth to the pigeons by means of a fine catheter introduced into the crop. The early dosage was 3 cc. daily but this having little effect the dosage was increased until a total of 18 cc. was given over a period of 4 days.

The results were as follows:

Average initial count, 17%. Average count of 13th day, 26%. Increase, 53%.

It will thus be seen that this gastric mucosa extract gave a very satisfactory response—in fact, practically as good a response as had been given by the liver extract. This reaction of the pigeons to the gastric extract is interesting and entirely logical inasmuch as they had reacted well to the administration of the desiccated material itself. It must be noted, however, that the dosage used was large but in considering the dosage of this extract it must not be overlooked that the preparation was given by mouth while the liver preparations were given by intramuscular injection, and it will be remembered that liver preparations given by mouth require a much larger dosage than when they are given by injection. The response to the extract, moreover, constitutes a corollary to the findings of Morris and his coworkers (2). They report that the intramuscular injection of concentrated normal gastric juice also produces a rise in the number of reticulocytes in patients and an increase in red blood cells and in hemoglobin. In the reports of these experiments, too, it is to be noted that enormous doses of unconcentrated gastric juice were given by mouth. In one case 10,000 cc. of hog gastric juice were administered without any effect on the reticulocytes. Apparently in the case of all these products a large proportion of the active substance must be destroyed in the alimentary canal inasmuch as oral administration requires a dosage much higher than is effective when the product is injected.

Comments.—The early efforts to determine the potency of antianemic agents by means of an increase in the number of reticulocytes in pigeons were unsatisfactory, apparently due to deterioration of the extracts tested. Later assays employing only small ampuls of material so that repeated exposure to the air was avoided gave very promising results. A number of extracts and other antianemic preparations which had been proved clinically to be potent were found to react in a positive manner when tested by this method. Other preparations which had been rendered clinically inactive by heat failed also to react here. Pigeons also responded to desiccated gastric tissue in a positive manner and also to a glycerin-aqueous extract of the gastric mucosa.

Our experience during the past year with this method of testing antianemic preparations leads us to feel that it is worthy of further study. The present situation of clinical testing is unsatisfactory not only for the commercial production of such preparations but also from the standpoint of scientific progress. On the other hand, experience on a much wider scale with the method herein described

is very desirable. It is not offered as a final answer to the problem but as a procedure worthy of trial.

In its use careful technic is essential—not only in regard to the staining of the blood but especially with respect to the counting of the reticulocytes. In the testing of a preparation it would seem important that the responsibility for the counts should rest upon one worker. Inasmuch as an occasional pigeon apparently fails to "react" it is important to utilize a sufficient number of birds. Experience only will tell how many, but we would suggest ten or twelve. In some birds the increase may begin later than the ninth or tenth day resembling the so-called delayed type of reaction.

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(2) Morris, Schiff, Burgen and Sherman, *J. Am. Med. Assoc.*, 98 (1932), 1080.

THE STANDARDIZATION OF ERGOT—A MODIFICATION OF SMITH'S QUANTITATIVE COLORIMETRIC ASSAY.*[1]

BY ASA N. STEVENS.

In view of the chemical nature of ergot and its preparations physiological methods of standardization have long been considered more satisfactory. None of the usual alkaloidal assay procedures have been found adequate. More recent investigations into the chemistry of ergot and the application of certain color reactions have given considerable promise that advantage might be taken of a more rapid and a more accurate colorimetric chemical method of standardization.

It is the object of this paper, therefore, to present some data accumulated over a period of about two years, using a modified colorimetric chemical assay method together with the Cock's Comb (Official U. S. P. X) and the Reversal Uteri (Broom and Clark (2)) methods All the comparative figures that are presented in tabulated form have been obtained from samples that were assayed by the indicated method within a period of one week.

DEVELOPMENT.

The observation that certain color reactions can be obtained with the constituents of ergot is not new. Tanret (6) observed color changes when concentrated sulphuric acid was poured on ergotinine. Later, Keller (3) improved the reaction by dissolving the alkaloid in glacial acetic acid, adding a trace of ferric chloride and pouring the sulphuric acid underneath. He obtained an immediate intensely blue color.

Van Urk (8) using a modification of the general reaction for indol derivatives, mixed 1 cc. of a one per cent solution of para-dimethyl-amino-benzaldehyde with an equal volume of an alcoholic solution of ergot alkaloid and poured sulphuric acid down the side of the tube. Smith (5) further modified van Urk's method by mixing 2 cc. of a one per cent tartaric acid solution of the alkaloid with 1 cc. of

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* Scientific Section, A. PH. A., Toronto meeting, 1932.
[1] A contribution from the Analytical Laboratories, Eli Lilly & Company.

M/60 para-dimethyl-amino-benzaldehyde in concentrated sulphuric acid and allowed sunlight to develop the blue color.

Smith's (5) quantitative modification of van Urk's original color reaction has been the subject of this investigation. Briefly, Smith's (5) procedure for the fluidextract of ergot is as follows:

"Five cc. of the fluidextract are evaporated on the water-bath under a current of air or *in vacuo* to remove the alcohol. Excess heating should be avoided. The thick, syrupy residue is transferred quantitatively with the aid of about 50 cc. H_2O to a separatory funnel. The aqueous suspension is rendered slightly alkaline with NH_4OH to a distinct blue reaction with litmus. About 2 cc. of 1:10 concentrated NH_4OH will generally suffice. The solution is than extracted with four successive portions of ether, using 40 cc. in the first, 25 cc. in the second and 15 to 20 cc. in the third and fourth. The ethers are then united, returned to the separatory funnel and washed two or three times with 25 cc. H_2O and a few drops of NH_4OH. This treatment removes most of the yellow alkali-soluble pigment which is present in greater or less amount in most ergots. One or two additional washings with water will remove the excess alkali. The washed ether is made up to 100 cc. and may be kept in this condition, if well stoppered and protected from light, for many weeks.

"To complete the determination, 50 cc. of the ether containing the alkaloids of 2.5 cc. of the fluidextract of ergot are extracted in a separatory funnel three times with an aqueous solution of one per cent tartaric acid, using 10, 10 and 5 cc., respectively. The acid solution is freed from ether by evaporating it on the water-bath under the electric fan to about 15 cc. and is made up to volume (20 cc.).

"Two tubes of 1 and 2 cc., respectively, of this solution are prepared and to the first 1 cc. H_2O added. To both tubes 1 cc. of *M*/60 para-dimethyl-amino-benzaldehyde in concentrated H_2SO_4 are added. The tubes are all exposed to direct sunlight for 30 minutes. They are then compared with standards containing 0.06, 0.08 and 0.10 mg. of ergotamine tartrate in a colorimeter. From these results the number of mg. per cc. of ergot alkaloids can be calculated."

This method was applied and the results obtained are given in Table I together with the physiological results that were obtained by the method of Broom and Clark.

TABLE I.

Sample No.	Chemical % Activity.	Reversal Uteri Method (Broom and Clark) % Activity.	Difference %.
1	160	150	+10
3	80	100	−20
4	80	100	−20
5	80	100	−20
6	80	100	−20
7	80	100	−20
8	50	40	+10
9	20	40	−20
10	28.8	55	−26.2
12	40	50	−10
13	40	50	−10
14	24	50	−26
15	20	30	−10
17	30	37.5	− 7.5
18	64	75	−11
19	80	90	−10

It will be observed that the chemical results (Table I) were, for the most part, lower than those obtained by the Broom and Clark method. These low re-

sults may be explained as being due to variations in technic, for example, the formation of emulsions and the fact that ether is a rather difficult solvent to measure accurately. It is possible that some of these factors may be eliminated and closer agreement obtained by making certain modifications in the procedure.

ETHER EXTRACTION.

With this thought in mind the first ether extraction was made by means of a Watkins' (9) extractor, instead of using a separatory funnel. The alkaloids were then shaken from the total ether extract into one per cent tartaric acid solution, the final dilution being made to 40 cc. instead of 20 cc. Table II gives some of the results obtained by using the Watkins' extraction apparatus.

TABLE II.

Sample No.	Chemical % Activity.	Reversal Uteri Method (Broom and Clark) % Activity.	Difference %.
20	92	100	− 8
21	74	85	−11
22	40	40	0
23	20	30	−10
24	40	50	−10
25	50	60	−10
26	50	50	0
27	90	100	−10

The results in Table II show that closer agreement was obtained.

ALCOHOL EVACUATION.

Since the initial evacuation of alcohol on the water-bath might lead to destruction of the alkaloid, and the transfer from one vessel to another is a source of error, it seemed advisable to eliminate this step. Consequently, 5 cc. of the fluidextract was pipetted directly into the Watkins' extractor, made alkaline with ammonia and extracted with ether. Some of the results are tabulated in Table III, which follows:

TABLE III.

Sample No.	Chemical % Activity.	Reversal Uteri Method (Broom and Clark) % Activity.	Difference %.
30	50	50	0
31	24	30	− 6
32	48	50	− 2
33	100	100	0
34	92	100	− 8
35	120	110	+10
36	104	90	+14
37	100	110	−10
38	87	90	− 3

The figures in Table III show that the initial alcohol evacuation is unnecessary and it was therefore discontinued.

THE ADDITION OF THE SULPHURIC ACID SOLUTION.

At the beginning of this investigation a difficulty arose which was of the greatest importance. In mixing the para-dimethyl-amino-benzaldehyde in con-

centrated sulphuric acid with the alkaloids in the one per cent tartaric acid solution, the mixture becomes hot and the blue color develops immediately, becoming deeper on exposure to sunlight. The color developed in this way gave unsatisfactory results and was of poor quality. In a number of instances an assay was repeated three or four times before a satisfactory color was obtained. Maintaining the tubes at a temperature of about 10° C. while adding the sulphuric acid solution solved this difficulty. In this case the blue color does not develop immediately, but does appear readily in direct sunlight or under a carbon arc. The color so obtained was found to be of greater intensity and of better quality. The figures in Table IV show the difference in results between the cooled and uncooled solutions.

TABLE IV.

Sample No.	Uncooled %.	Cooled %.	Difference %.
A	50	67	17
B	84	88.8	4.8
C	80	88.8	8.8
D	53	67	14
E	80	88.8	8.8
F	93.5	106	12.5
G	113	120	7
H	100	100	0
I	88.8	100	11.2
J	54	80	26

Note that the cooled solutions give higher results, varying from 0 per cent to 26 per cent.

THE MODIFIED PROCEDURE.

In consideration of the foregoing results, Smith's method has been modified as follows:

An aliquot portion of the sample to be tested is pipetted into a Watkins' extractor and diluted to about 50 cc. with distilled water. This aqueous suspension is then made faintly alkaline to litmus with three per cent ammonia. A large excess should be avoided because, in some instances, it tends to destroy the alkaloid. A small piece of litmus paper is placed in the aqueous suspension as an indicator. Ether is then added and the alkaline solution extracted for four hours on a water-bath using just enough heat to cause continuous evaporation

At the end of this time the apparatus is dismantled and the total ether extract transferred to a separatory funnel. This is washed with successive 25-cc. portions of distilled water containing a few drops of three per cent ammonia *as many times as are necessary* to remove any yellow color. One or two additional washings with distilled water should be used to remove any excess alkali.

The washed ether is extracted three times with one per cent aqueous tartaric acid solution, using 10-, 10- and 5-cc. portions, respectively. The aqueous tartaric acid solution is then freed from ether by gentle heating on a water-bath and diluted to 40 cc.

Two tubes containing 1 and 2 cc., respectively, of this solution are prepared. To the first, 1 cc. of distilled water is added. Both tubes are then immersed in

cold water (about 10° C.) and to each tube 1 cc. of $M/60$ para-dimethyl-amino-benzaldehyde in concentrated sulphuric acid is *slowly* added. *Care should be taken to keep the tubes cold.* The tubes are then stoppered and either exposed to bright sunlight for two hours or a carbon arc for forty-five minutes. A blue color develops if the sample tested is active.

The tubes are then compared in a colorimeter with standards containing known quantities of ergotamine tartrate. From this data the quantities of the alkaloid in the sample tested can be calculated.

About a year ago, E. E. Swanson had occasion to study the deterioration of fluidextract of ergot under varying conditions. To different samples of this fluidextract, containing either hydrochloric acid or tartaric acid there was added one of the following salts: sodium acid phosphate; sodium hyposulphite; or sodium hydrosulphite. After a period of aging their activity was determined using the modified procedure already described. The results appear in Table V.

TABLE V.

Sample No.	Chemical % Activity.	Reversal Uteri Method (Broom and Clark) % Activity.	Difference %.
142	26	23	+ 3
143	88 8	67	+21.8
144	106	109	− 3
145	100	100	0
146	67	100	−33
147	68	64	+ 4
148	80	95	−15
149	62	86	−24
150	88.8	82	+ 6.8
151	88.8	80	+ 8.8
152	67	91	−24
153	88.8	80	+ 8.8
154	106	88	+18
155	100	100	0
156	100	85	+15
157	100	80	+20
158	80	70	+10
159	110	83	+27
Original activity	120	120	0
after aging	81	80	+ 1

The results thus far recorded have applied only to the fluidextract. The following table (VI) gives the results obtained with solutions of a pure ergotamine salt that were manipulated in such a manner as to bring about their gradual deterioration. These samples originally contained 0.05% of the pure salt of ergotamine in each cc. of hydro-alcoholic solution. There were also added to some of the samples one of the acids, and one of the salts mentioned in connection with Table V.

TABLE VI.

Sample No.	Chemical % Activity.	Reversal Uteri Method (Broom and Clark) % Activity.	Difference %.
113	*−10	*7	....
114	−10	13	....
115	−10	10	....

TABLE VI. (*Continued.*)

Sample No.	Chemical % Activity.	Reversal Uteri Method (Broom and Clark) % Activity.	Difference %.
116	10	32.5	−22.5
117	5	25	−20
118	10	22	−12
119	40	58	−18
120	50	72	−22
121	30	47	−17
122	−10	18	....
123	60	60	0
124	25	18	+ 7
125	−10	8	....
126	−10	35	....
127	20	41	−21
128	−10	4.7	....
129	54.5	63	− 8.5
130	−10	6	....
131	20	10	+10
132	−10	−10	0
133	−10	−10	0
134	56	43	+13
135	50	40	+10
136	48.4	34	+14.4
137	46	38	+ 8
138	44.4	43	+ 1.4
139	−10	−10	0
140	45	50	− 5

* Minus signs used in these columns express values that are below the indicated figures, for example: "−10" means that the sample was found to be less than ten per cent active.

It will be noted that all the samples indicated in Tables V and VI have deteriorated, nine of them varying more than ± 20% from their corresponding physiological assay results.

THE MODIFIED PROCEDURE, REVERSAL UTERI AND COCK'S COMB METHODS.

Table VII shows the results obtained on some samples of the fluidextract of ergot using the modified procedure, the Cock's Comb (Official U. S. P. X) and the Broom and Clark methods.

TABLE VII.

Sample No.	Chemical % Activity.	Reversal Uteri Method (Broom and Clark) % Activity.	Cock's Comb U. S. P. X % Activity.
1	90	100	100
2	100	110	100–120
3	110	100	100
4	100	95	97
5	116	100	114
6	96	100	91
7	120	100–115	100
8	110	85–90	100
9	100	100	120
10	110	115	100–106
11	100	115	110

12	50	50	70
13	100	100	100
14	10–15	25	−40
15	35	40	50–60
16	65	100	80

DISCUSSION.

Neither the modified procedure, nor the reasons for modification need be discussed here. The data presented with each step should suffice. It would be well to discuss, however, Tables V and VI in the light of some recent reports.

Wokes (7) states that the Maurice Smith Tests "Fail to distinguish between 'active' and 'inactive' alkaloids" and draws the conclusion that the method as at present applied cannot be considered a satisfactory one for directly estimating the physiological activity of ergot preparations.

Barger (1) states that

"Since all these chemical methods of alkaloidal assay estimate the very slightly active ergotinine along with the real active principles, their validity has been doubted..... As regards ergotamine, Stoll is of the opinion that this alkaloid is only formed artificially by the reagents in some extraction processes..... Thompson has put forward the view that there is only one alkaloid in ergot, which according to the method of extraction may be isolated as ergotinine, ergotamine or ergotoxine."

Rice (4) says that

"Individual laboratories, working upon the same samples of fluidextract have generally found that the colorimetric method has yielded results consistent with those obtained by physiological means. However, merely on a theoretical basis, the method may not be entirely trustworthy since it is known that the physiologically inactive alkaloids of ergot give the color reaction."

It has been decided by the sub-committee for the revision of the British Pharmacopœia to recommend the introduction of a colorimetric assay for ergot. Wokes (7) gives the reason in these words:

"The colorimetric method measures the physiologically active alkaloid with greater accuracy than the biological method measures the physiologically active alkaloid. Tests on over twenty different extracts of ergot showed that the two methods run fairly parallel and it appears probable that any variation which may occur in the proportions of 'active' and 'inactive' alkaloid is less than the possible error of the biological method."

The samples in Tables V and VI did lose potency and therefore must have contained the degradation products of the alkaloids in the fluidextract and in the solutions of the ergotamine salt. This being true, it leads one to believe that the physiologically inactive alkaloids are not degradation products of the active alkaloids, or high results should have been obtained. Furthermore, one would suspect that the physiologically inactive alkaloids do not occur in ergot.

Up to the present time our laboratory has assayed, colorimetrically, more than two hundred and twenty-five samples of ergot preparations by the modified procedure. These preparations include commercial preparations placed upon the market under trade names, as ampules or liquid extracts, as well as the official fluidextract of ergot. Of this number one hundred and eighty-seven have been checked against the Reversal Uteri or Cock's Comb methods. Of these, fifteen have fallen outside the limits of ±20% when compared with the corresponding physiological test.

CONCLUSION.

1. A modified colorimetric procedure has been presented based upon Smith's Quantitative Colorimetric Reaction.

2. Data obtained while comparing the modified colorimetric procedure, the Cock's Comb and the Broom and Clark methods of physiological standardization have been given.

3. The presence of hydrochloric and tartaric acids, sodium hydrosulphite, sodium acid phosphate or sodium hyposulphite does not interfere with the modified colorimetric procedure.

The author is indebted to Mr. Clarence E. Powell for the Broom and Clark and to Mr. C. C Hargreaves for the Cock's Comb assay results appearing in this paper. He also wishes to express his appreciation to Mr. W. J. Rice and Mr. E. J. Hughes for their friendly criticism.

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THE BUFFER CAPACITY OF TINCTURE OF DIGITALIS.*

BY JOHN C. KRANTZ, JR.

INTRODUCTION.

Hydrogen-ion concentration and buffer capacity of various extractive preparations have received the attention of the pharmacist and physical chemist during the past few years. The buffer capacity of the extractive preparations of ergot was studied by Wokes and Elphick (1) in 1930. In addition, Thompson (2) in his comprehensive study of ergot mentioned the buffer value of ergot in his efforts to adjust the hydrogen-ion concentration of the fluidextract. In studying the work of Joachimaglu and Bose (3), the author (4 and 5) observed the rather striking buffer capacity of the extractive substance obtained in the percolation of digitalis leaves with hydroalcoholic menstrua.

Wokes (6) examined the relationship between the total solids of various tinctures of digitalis and their potency and found the relationship to be of no significance. With Munch (7) the author showed that there existed a great variation in the potency of tinctures prepared with absolute alcohol and those prepared

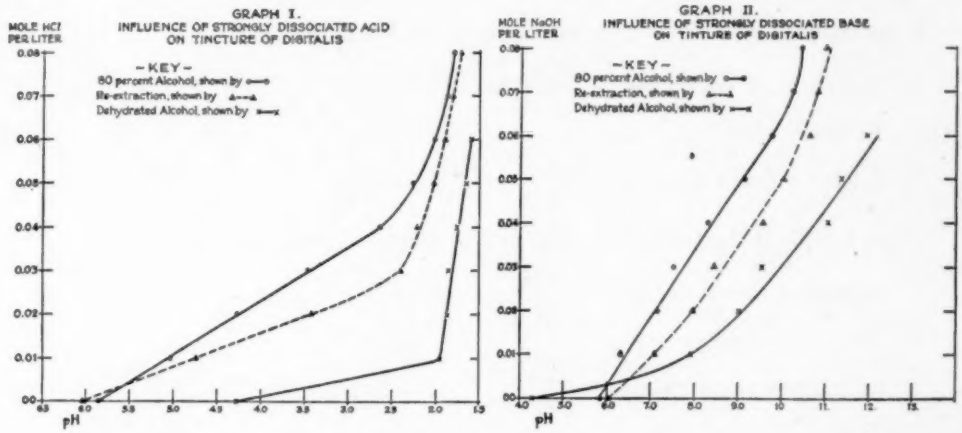
* Scientific Section, A. PH. A., Toronto meeting, 1932.

with 80 per cent alcohol. This difference in heart-tonic value is accompanied by a marked difference in hydrogen-ion concentration. On account of the differences in heart-tonic value and hydrogen-ion concentration existing between these tinctures it was decided to measure their buffer capacities.

EXPERIMENTAL.

Tinctures of digitalis were prepared from six specimens of digitalis leaves using 80 per cent alcohol as a menstruum. These tinctures were mixed to obtain a composite sample. From the same specimens of leaves tinctures were prepared using dehydrated alcohol as a menstruum: likewise a composite sample of tincture was prepared. The marcs obtained from the preparation of the tinctures with dehydrated alcohol were re-percolated with 80 per cent alcohol. The composite tincture prepared by this extraction was studied also.

To a definite volume of each of the three tinctures was added definite Gm. equivalents of hydrochloric acid and sodium hydroxide, respectively. The hydrogen-ion concentration of these tinctures to which strongly dissociated acid and base were added was measured electrometrically using a hydrogen electrode Wilson (8) type. The results expressed in p_H were reproducible within ± 0.1 unit.



The differential ratio suggested by Van Slyke (9) $\frac{dB}{dp_H}$ was employed as a unit of measurement. This ratio expresses the relationship between the increment in Gm. equivalents of strong base added to the buffer solution and the resultant increment in p_H. If an acid is added the value of each term in the expression is negative, and the buffer capacity represented by "β" retains its positive value.

The results of these measurements are shown in Tables I and II and plotted in Graphs I and II.

TABLE I.—STRONGLY DISSOCIATED ACID.

No.	Cc. 0.1 *N* HCl per L.	Mole HCl per L.	p_H Menstruum, 80 Per Cent Alcohol.	p_H Tincture, 80 Per Cent Alcohol.	p_H Tincture, Dehydrated Alcohol.	p_H Tincture, Reextraction.
0	0.00	0.00	6.35	5.85	4.28	6.03
1	100	0.01	2.18	5.03	1.96	4.74
2	200	0.02	1.89	4.27	1.87	3.42
3	300	0.03	1.71	3.46	1.86	2.41

TABLE I.—STRONGLY DISSOCIATED ACID. (*Continued.*)

No.	Cc. 0.1 *N* HCl per L.	Mole HCl per L.	p_H Menstruum, 80 Per Cent Alcohol.	p_H Tincture, 80 Per Cent Alcohol.	p_H Tincture, Dehydrated Alcohol.	p_H Tincture, Reëxtraction.
4	400	0.04	1.60	2.65	1.77	2.22
5	500	0.05	1.49	2.27	1.66	2.03
6	600	0.06	1.39	2.03	1.60	1.91
7	700	0.07	1.36	1.88	..	1.81
8	800	0.08	1.33	1.81	..	1.72

TABLE II.—STRONGLY DISSOCIATED BASE.

No.	Cc. 0.1 *N* NaOH per L.	Mole NaOH per L.	p_H Menstruum, 80 Per Cent Alcohol.	p_H Tincture, 80 Per Cent Alcohol.	p_H Tincture, Dehydrated Alcohol.	p_H Tincture, Reëxtraction.
0	0.00	0.00	6.35	5.85	4.28	6.03
1	100	0.01	12.66	6.32	7.93	7.10
2	200	0.02	12.78	7.16	9.01	7.97
3	300	0.03	12.79	7.52	9.55	8.45
4	400	0.04	12.74	8.30	11.04	9.57
5	500	0.05	12.76	9.16	11.35	10.05
6	600	0.06	12.77	9.77	11.94	10.65
7	700	0.07	12.80	10.25	...	10.82
8	800	0.08	12.78	10.45	...	11.09

From Graph I the following relationships may be calculated:

80 per cent alcohol tincture $\frac{-\Delta B}{-\Delta p_H} = \frac{0.012}{1} = 0.012$

Reëxtraction tincture $\frac{-\Delta B}{-\Delta p_H} = \frac{0.010}{1} = 0.010$

Dehydrated alcohol tincture $\frac{-\Delta B}{-\Delta p_H} = \frac{0.004}{1} = 0.004$

From Graph II the following relationships may be calculated:

80 per cent alcohol tincture $\frac{\Delta B}{\Delta p_H} = \frac{0.016}{1} = 0.016$

Reëxtraction tincture $\frac{\Delta B}{\Delta p_H} = \frac{0.010}{1} = 0.010$

Dehydrated alcohol tincture $\frac{\Delta B}{\Delta p_H} = \frac{0.003}{1} = 0.003.$

These values represent measurable increments of acid and base, respectively, necessary to change the p_H of the tinctures one unit. In order to obtain the differential ratio $\frac{dB}{dp_H}$ or β it is necessary to draw a tangent to the curve at a definite point. Values on the ordinate axis above and below this point are taken and the base line intercepts of the tangent at these points are determined. For these tinctures over a considerable p_H range the curves are essentially straight lines, and for practical purposes the ratio obtained by the use of measurable increments is practically the same as the differential ratio.

SUMMARY.

1. The buffer capacities of composite tinctures of digitalis made according to the foregoing description have been determined.

2. The buffer capacity of the tincture prepared with dehydrated alcohol is comparatively negligible.

3. The sum of the buffer capacities of the dehydrated alcohol and the re-extraction tinctures is essentially the same as the buffer capacity of the 80 per cent alcohol tincture.

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SIGNIFICANCE OF STEARIN CONTENT OF COD LIVER OIL.*

BY GEORGE E. ÉWE.

Stearin is a normal constituent of the oil obtained upon rendering cod livers with steam in the manufacture of cod liver oil. Stearin congeals to a solid at only a moderately low temperature at which the other constituents of the oil remain quite fluid and it is the general practice to remove more or less of the stearin during the process of refining the oil by chilling the oil and filtering off the hardened stearin.

The object of removing this stearin is to produce a cod liver oil which will not become cloudy or thick from separation of stearin when the oil is subjected to practical low temperatures.

Removal of the stearin from cod liver oil has, in general, no significant effect upon the vitamin A potency of the oil. Crude cod liver oil and the refined oil and stearin all possess relatively high vitamin A potency, the refined oil sometimes having the higher potency of the three substances, although usually there is no significant difference between the potency of the crude cod liver oil and the refined oil made from it.

Prof. E. Poulsson of Oslo, Norway, in a private communication to the Tailby-Nason Co., writes on this subject, the following being a translation by S. Hammer, an employee of the Tailby-Nason Co.:

"Minute quantities of stearin present in refined cod liver oil have no influence on the digestive organs. Minute quantitites of stearin present in cod liver oil do not lower the vitamin content in the oil. It has been shown by research work both here, and in other laboratories, that the separated stearin contains the same quantitites of vitamins as the liquid oil. In earlier times, the refrigeration of cod liver oil was almost always done by exposing containers of cod liver oil to the cold in the winter. At present, as far as I know, refrigerating plants are in use, and the temperature of the oil varies between zero and 4 below zero Centigrade. This is sufficient for all practical uses; at a lower temperature, the oil will undoubtedly be cloudy, but we presume that oil exported from this country, very seldom is exposed to a lower temperature. I do not know of any literature bearing on the above questions. The above information is built partly on our own research work, partly on what I have read in different journals, and partly on my own experience (in regard to temperature), from producers."

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* Scientific Section, A. PH. A., Toronto meeting, 1932.

There is no uniformity of opinion regarding the temperature at which the stearin should be removed from cod liver oil.

Thorpe's "Dictionary of Applied Chemistry," in referring to the physical characteristics of an oil (olive) intended for ingestion, states that "oils intended for table use, which deposit 'stearine' in winter, must be freed from such solid fats." The British Pharmacopœia requires solid fat to be separated from cod liver oil by chilling of the oil at about —5° C. (23° F.), followed by filtration. The U. S. Dispensatory states "in some establishments this (stearin) is removed (from cod liver oil) by chilling to —10° C. (14° F.) and expression . . . . . ."

The usual refining process does not entirely deplete the oil of stearin and consequently cod liver oil becomes cloudy or congeals if cooled below the temperature at which the chilling and filtration were conducted in the refining process. Commercial refining practices also vary widely in different establishments as regards temperature at which the stearin is removed and, consequently, the effect of an identical low temperature on the products of these establishments varies widely. For instance, when perfectly clear cod liver oils of various brands were kept at an identical low temperature some remained clear, some showed a mere trace of precipitate of stearin, some showed a heavy precipitate of stearin and others became almost solid from precipitated stearin.

The effects of low temperatures upon various brands of cod liver oil on the market are shown in the table below. The table indicates the effect of an identical temperature upon various brands and the effects of different temperatures on the same brand. In making these comparisons the oils were kept in bottles in air at the specified temperature for several hours and the results then recorded.

Sample No.	20° F. (−7° C.)	18° F. (−8° C.)	16° F. (−9° C.)	14° F. (−10° C.)	10° F. (−12° C.)
1	C	C	P	T	
2	C	C	P	T	
3	C	P	T		
4	C	P	T		
5	C	C	P	P	T
6	C	C	P	P	P
7	C	C	T		
8	C	H	P	T	
9	C	H	P	T	
10	C	H	P	T	
11	C	C	P	P	P
12	C	C	C	C	C
13	C	P	T		
14	C	P	T		
15	C	P	T		
16	C	C	H	H	H
17	C	C	C	C	C
18	C	T			
19	C	T			
20	C	T			
21	C	T			
22	C	T			

C = clear. H = hazy or cloudy. P = ppt. of stearin. T = thick or congealed by stearin.

It will be noted that all of the oils remained clear at 20° F. (—7° C.) which

appears to be a sufficiently low temperature to insure preservation of the oil and which is much lower than the temperature at which it is administered.

There is no unanimity of opinion regarding the temperature to which it should be possible to cool cod liver oil without causing separation of stearin. The "U. S. P." does not refer to this subject. The British Pharmacopœia states that no solid fat should separate when cod liver oil is exposed for 3 hours to a temperature of 0° C. (32° F.). Caspari's "Treatise on Pharmacy" also states that this oil should not deposit solid fat when cooled to 0° C. (32° F.).

While cod liver oil from which sufficient stearin has been removed to allow the oil to remain clear at about 0° C. (32° F.) would seem to answer all practical requirements, producers invariably refine this oil so as to withstand much lower temperatures without clouding.

One of the objections occasionally made to taking oily medicaments is the "oily" feeling in the mouth and throat caused mainly by the viscosity of the oil. Consequently, the more viscous the oil at a given temperature, the more objectionable from this standpoint. Since the stearin of cod liver oil causes thickening of this oil at excessively low temperatures it becomes of interest to ascertain the probable effect of the stearin content upon the viscosity of cod liver oil at temperatures at which it is likely to be taken. Assuming that the degree of haziness, precipitation or thickening shown by cod liver oil upon strong cooling is a rough measure of the stearin content, viscosity determinations were made on the samples marked 12, 5, 8 and 15 in the preceding table, the stearin content being apparently progressively greater in the order the numbers are here set down; the samples covering practically the full range of cold effects reported in the above table. The viscosity tests were made at room temperature (25° C.) and at refrigerator temperature (10° C.) since these are approximately the temperatures at which the oil is ordinarily kept and administered.

Oil No.	U. S. P. IX Liq. Petrolatum Viscosity Test.	
	25° C.	10° C.
12	5.64	8.43
5	5.32	7.85
8	5.64	8.00
15	5.80	8.14

Examination of the results in this table indicate that there is likely no significant relation between the apparent stearin content of these oils and their viscosity either at room or refrigerator temperature, for the oils do not become significantly more viscous as the stearin content progressively rises. However, there is undoubtedly a decided relation between the stearin content and viscosity of these oils at much lower temperatures. The viscosities of numerous medicinal cod liver oils from various sources were not found to vary significantly at room temperature but all showed greatly increased viscosity at refrigerator temperature to substantially the same degree as shown in the preceding table. As a consequence, where it is desired to minimize the influence of viscosity upon the taking of cod liver oil it is well to direct that the dose be taken from a small bottle of the oil kept at room temperature, the main supply being preserved in the refrigerator or other cool place.

Initially clear cod liver oil which has become cloudy or even solid from low temperatures regains its original clarity when the temperature of the oil is allowed

to rise spontaneously to somewhat below room temperature, there being no necessity to apply strong heating measures, such as placing the container in an oven or in hot water. Cod liver oil apparently suffers no damage from this alternate "freezing" and "thawing," but when cloudy, precipitated or thickened or congealed by cold the product is less sightly and, consequently, should not be exhibited for sale purposes if it should happen to have been allowed to get into this condition.

While the ability of a cod liver oil to remain clear at extremely low temperatures is of value as one of the points of pharmaceutical elegance, proper consideration must also be accorded to other important characteristics such as vitamin potency, palatability, attractiveness of color, inoffensiveness of odor, freedom from rancidity and excessive acidity and peroxides, absence of bleaching or other chemical agents, uniformity of potency and physical characteristics and stability.

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A COMPARATIVE STUDY OF THE COMMERCIAL VARIETIES OF MILD SILVER-PROTEIN, U. S. P. X.*

BY FLORIN J. AMRHEIN.[1]

Preparations of Mild Silver-Protein as found commercially may be grouped as follows: (A) Mild Silver-Protein, U. S. P. X, (B) Proprietary brands of Mild Silver-Protein U. S. P., (C) Proprietary brands of related substances containing silver in colloidal form. Mild Silver-Protein, U. S. P. X, is defined as follows: Silver rendered colloidal by the presence of or combination with protein. It contains not less than 19 per cent and not more than 25 per cent of silver (Ag).

Group (A) preparations are usually labeled as follows: Mild Silver-Protein, U. S. P. X, containing not less than 19 per cent and not more than 25 per cent of silver. Group (B) preparations are generally labeled as follows: . . . . , A brand of Mild Silver-Protein U. S. P. X, containing from 19 per cent to 23 per cent (or 19 to 25 per cent) of silver in colloidal form. Group (C) preparations are usually labeled with a coined name, and no statement is made concerning their composition.

For the purpose of this study the following preparations were selected, Group (A), Mild Silver-Protein, U. S. P. Group (B) Silver Nucleinate, Silvol and Solargentum. Group (C) Argyrol, Lunargen and Silver Nucleinate.

In this study the author makes no claims concerning the comparative therapeutic value of these preparations. The work includes the description and physical properties of these substances together with identity tests and assays for silver.

COMPARISON OF DESCRIPTION AND PHYSICAL PROPERTIES.

Mild Silver-Protein, U. S. P.—Dark brown or almost black shining scales or granules. It is odorless, and slightly hygroscopic. It is soluble in water, but almost insoluble in alcohol, chloroform and ether.

Silver Nucleinate, Mild Silver-Protein, U. S. P.—Brownish black to black shining scales. It is odorless, hygroscopic in moist air and efflorescent in dry air. It is soluble in water, but insoluble in alcohol, chloroform and ether.

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* Scientific Section, A. PH. A., Toronto meeting, 1932.

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Silvol, Mild Silver-Protein, U. S. P.—Black shining scales and granules with a greenish iridescence. It is soluble in water, but almost insoluble in alcohol, chloroform and ether. It is hygroscopic in moist air.

Solargentum, Mild Silver-Protein, U. S. P.—Black shining scales or granules. It is odorless, hygroscopic in moist air and slightly efflorescent in dry air. It is soluble in water, but almost insoluble in alcohol, chloroform and ether.

Silver Nucleinate, Not U. S. P.—Very fine shining granules. It is odorless, hygroscopic in moist air. It is soluble in water, but almost insoluble in alcohol, chloroform and ether.

Lunargen, Not U. S. P.—Black shining scales. It is odorless, hygroscopic in moist air. It is soluble in water, but almost insoluble in alcohol, chloroform and ether.

Argyrol, Not U. S. P.—Dull black irregular tabular pieces. It is odorless, very hygroscopic in moist air and efflorescent in dry air. It is soluble in water, but almost insoluble in alcohol, chloroform and ether.

In each instance it was observed that when these preparations were exposed to moist air they all absorbed moisture. The amount of moisture absorbed depended upon the length of time that they were exposed and also upon the relative humidity present in the air. When the relative humidity was comparatively, low, *i. e.*, between 15 and 20 per cent, these preparations were slightly efflorescent.

TESTS FOR IDENTITY.

About 0.1 Gm. of each preparation was ashed in a porcelain dish, the warm residue treated with nitric acid, and diluted with 10 cc. of distilled water. The addition of hydrochloric acid produced a white precipitate which dissolved in an excess of ammonium hydroxide test solution. All of the preparations gave a positive reaction with this test.

Two cc. of an aqueous solution of sodium chloride (1 in 100) were treated with 10 cc. of an aqueous solution of each preparation (1 in 100), no turbidity was produced by any of the preparations under test.

WITH FERRIC CHLORIDE TEST SOLUTION.

Sample No.		
1.	Mild Silver-Protein, U. S. P.	Curdy, light, flesh-colored precipitate. Olive-green, opaque, supernatant liquid
2.	Silver Nucleinate, U. S. P.	Light, flesh-colored precipitate. Greenish yellow, opaque, supernatant liquid
3.	Silvol	Curdy, flesh-colored precipitate. Brown, opaque, supernatant liquid
4.	Solargentum	No precipitate formed. Greenish brown, opaque, supernatant liquid
5.	Silver Nucleinate, not U. S. P.	Cream-colored precipitate. Brown, supernatant liquid
6.	Lunargen	White precipitate. Olive-green, translucent, supernatant liquid
7.	Argyrol	Curdy, gray precipitate, turning lavender within one minute. Olive-green, transparent, supernatant liquid

In all of the above tests the dark color of the original silver-protein solution was discharged by the ferric chloride test solution.

WITH MERCURIC CHLORIDE TEST SOLUTION.

Sample No.	
1.	Milky, opalescent solution
2.	Milky, opalescent solution
3.	Light blue, slightly opalescent solution
4.	Slightly opalescent solution
5.	Three-fourths of a test-tube of a gelatinous precipitate, clear supernatant liquid
6.	Milky opalescent solution
7.	Fine, milky suspension, opaque, supernatant liquid

In all of the above tests the dark color of the original silver-protein solution was discharged by the mercuric chloride test solution.

WITH ESBACH'S SOLUTION.

Sample No.	
1.	Brown precipitate
2.	Brownish black precipitate
3.	Curdy, brown precipitate
4.	Curdy, dark brown precipitate
5.	Black to brownish precipitate
6.	Curdy, brownish black precipitate
7.	Black precipitate, mirror formed on sides of tube

WITH IODINE TEST SOLUTION.

Sample No.	
1.	Light brown precipitate
2.	No precipitate, orange liquid
3.	No precipitate, orange liquid
4.	No precipitate, orange liquid
5.	Light brown precipitate
6.	No precipitate, brownish red liquid
7.	One-half inch of yellow precipitate in tube, orange liquid

WITH MERCURIC NITRATE TEST SOLUTION.

Sample No.	
1.	Yellowish white flocculent precipitate. Clear, supernatant liquid
2.	Yellow flocculent precipitate. Opaque, supernatant liquid
3.	Yellow flocculent precipitate. Colorless, supernatant liquid
4.	Yellowish, resinous-like precipitate, clings to sides of tube. Opalescent, supernatant liquid
5.	Yellowish white precipitate. Clear supernatant liquid
6.	Yellowish white flocculent precipitate. Colorless, supernatant liquid
7.	Slight white flocculent precipitate. Colorless, supernatant liquid

WITH MILLON'S REAGENT.

Sample No.	
1.	Cream-colored precipitate. Opaque, supernatant liquid
2.	Cream-colored precipitate. Clear, pink-colored, supernatant liquid
3.	Pink-colored precipitate. Clear, supernatant liquid
4.	Pink-colored, resinous precipitate. Opalescent, pink-colored, supernatant liquid
5.	Cream-colored precipitate. Opalescent, pink-colored, supernatant liquid
6.	White, curdy precipitate. Pink, supernatant liquid
7.	Cream-colored precipitate. Opalescent, milky, supernatant liquid

WITH NESSLER'S REAGENT.

Sample No.	
1.	Dirty brownish black solution
2.	Same as above
3.	Same as above
4.	Same as above
5.	Same as above
6.	Same as above
7.	Same as above

The above tests were of little value as identity tests.

Gas Formation.—When tested by the method described under Strong Silver-Protein, U. S. P. X, page 63, 0.8 cc. of an aqueous solution of each of the preparations under test (1 in 20) permitted abundant gas formation.

The writer has observed that many manufacturers of Mild Silver-Protein and other closely related substances have cautioned users of their products by stating that the product is hygroscopic and that it should be kept in sealed containers. It has been found by actual determination that when these products are purchased in original sealed bottles that the moisture content varies over a relatively wide

range for different lots of the same product. In determining the moisture content in material from opened bottles it has been found that the moisture content may reach as high as 12 per cent without the contents becoming sticky.

Determination of Moisture.—Accurately weigh about 2 Gm. of the sample in a tared porcelain evaporating dish. Dry at a temperature of 100° C. for twelve hours, and weigh. Continue the drying and weighing at half-hour intervals until the weight is constant. The weight was considered constant when the loss was not greater than one mg. in the last two weighings.

RESULTS.

Sample.	Moisture.
Mild Silver-Protein, U. S. P.	6.80%
Silver Nucleinate, U. S. P.	5.62%
Silvol	5.37%
Solargentum	7.23%
Silver Nucleinate, not U. S. P.	7.60%
Lunargen	4.05%
Argyrol	5.39%

Determination of Total Ash.—The residue from the moisture determination was carefully ignited at dull red heat until free from carbon and until a grayish white ash was obtained. The per cent of total ash was calculated from the weight of sample taken in the moisture determination.

RESULTS.

Sample.	Total Ash.
Mild Silver-Protein, U. S. P.	30.01%
Silver Nucleinate, U. S. P.	28.71%
Silvol	28.81%
Solargentum	29.12%
Silver Nucleinate, not U. S. P.	26.09%
Lunargen	28.00%
Argyrol	35.74%

Determination of Acid-Insoluble Ash.—The total ash was digested with 25 cc. of nitric acid test solution on a water-bath for one hour. The insoluble material was then collected on a tared filter paper, washed free from acid, ignited in the crucible in which the sample was ashed and then dried to constant weight in a drying oven at 100° C., and weighed. Then the per cent of acid-insoluble ash was calculated from the weight of sample taken in the ash determination. In almost every instance the acid-insoluble ash appeared steel gray to black on the filter paper.

RESULTS.

Sample.	Acid-Insoluble Ash.
Mild Silver-Protein, U. S. P.	0.40%
Silver Nucleinate, U. S. P.	0.47%
Silvol	0.17%
Solargentum	1.06%
Silver Nucleinate, not U. S. P.	0.36%
Lunargen	0.03%
Argyrol	0.78%

Calculations of Acid-Soluble Ash.—The acid-soluble ash was calculated subtracting the per cent of acid-insoluble ash from the per cent of total ash found.

RESULTS.

Sample.	Acid-Soluble Ash.
Mild Silver Protein, U. S. P.	29.61%
Silver Nucleinate, U. S. P.	28.24%
Silvol	28.64%
Solargentum	28.06%
Silver Nucleinate, not U. S. P.	25.73%
Lunargen	27.97%
Argyrol	34.96%

Determination of Water-Soluble Ash.—The ash obtained from about 2 Gm. of sample was digested on a water-bath with 50 cc. of distilled water for several hours. It was then filtered into a 100-cc. volumetric flask and cooled; the beaker, dish and residue on the filter paper were washed with enough distilled water to make exactly 100 cc. A 20-cc. portion of the well-mixed solution was then evaporated in a tared porcelain dish on a water-bath and dried to constant weight and the amount of water-soluble ash calculated. The water-soluble ash was an opaque-white residue with a slight pearly lustre. The residue effervesced slightly with dilute mineral acids.

RESULTS.

Sample.	Water-Soluble Ash.
Mild Silver-Protein, U. S. P.	11.12%
Silver Nucleinate, U. S. P.	9.62%
Silvol	8.71%
Solargentum	9.53%
Silver Nucleinate, not U. S. P.	3.83%
Lunargen	9.88%
Argyrol	15.91%

QUALITATIVE EXAMINATION OF WATER-SOLUBLE ASH.

Sample.	Metallic Ions.	Acidic Ions.
Mild Silver-Protein, U. S. P.	Sodium, Potassium	Chlorides, sulphates, carbonates
Silver Nucleinate, U. S. P.	Sodium, Potassium	Chlorides (trace), sulphates, carbonates
Silvol	Sodium, Potassium	Chlorides (trace), sulphates, carbonates
Solargentum	Sodium, Potassium	Chlorides (strong), sulphates, carbonates
Silver Nucleinate, not U. S. P.	Sodium, Potassium	Chlorides, sulphates, carbonates
Lunargen	Sodium, Potassium	Chlorides, sulphates, carbonates
Argyrol	Sodium, Potassium	Chlorides (strong), sulphates, carbonates (strong)

Determination of the Alkalinity of the Water-Soluble Ash.—A 20-cc. portion of the solution of the water-soluble ash was titrated with 0.1 *N* H_2SO_4 V.S., using methyl orange as the indicator. The number of cc. of 0.1 *N* H_2SO_4 V.S., required for neutralization, was calculated on the basis of 1 Gm. of the original sample.

RESULTS.

Sample.	Cc. of 0.1 *N* H_2SO_4 per Gm. of Sample.
Mild Silver-protein, U. S. P.	18.75
Silver Nucleinate, U. S. P.	16.20
Silvol	13.47
Solargentum	14.75
Silver Nucleinate, not U. S. P.	5.75
Lunargen	16.71
Argyrol	25.72

Determination of Chlorine in the Water-Soluble Ash.—The per cent of chlorine in the water-soluble ash was determined by titration using $AgNO_3$ V.S. (1 cc. = 0.0005 Gm. of Cl), with potassium chromate as the indicator. A 20-cc. portion of the solution of the water-soluble ash described above was used for the determination.

RESULTS.

Sample.	Per Cent of Chlorine.
Mild Silver-Protein, U. S. P.	0.13%
Silver Nucleinate, U. S. P.	0.08%
Silvol	0.09%
Solargentum	0.39%
Silver Nucleinate, not U. S. P.	0.13%
Lunargen	0.05%
Argyrol	0.33%

Determination of Sulphates as SO_3 in the Water-Soluble Ash.—The per cent of sulphuric anhydride in the water-soluble ash was determined by precipitation with barium chloride T.S., in the presence of hydrochloric acid T.S. The amount of barium sulphate obtained was dried to constant weight and calculated to per cent of sulphuric anhydride.

RESULTS.

Sample.	Per Cent of SO_3.
Mild Silver-Protein, U. S. P.	0.18%
Silver Nucleinate, U. S. P.	0.11%
Silvol	0.17%
Solargentum	0.22%
Silver Nucleinate, not U. S. P.	0.11%
Lunargen	0.11%
Argyrol	0.17%

Determination of Silver Content, U. S. P. X, Assay.—Ignite about 1 Gm. of Mild Silver-Protein accurately weighed in a porcelain crucible until all of the carbon is burned off. Transfer as much as possible of the residue to a beaker, add to the crucible 5 cc. of nitric acid, warm to dissolve any adhering silver, and transfer the solution to the beaker with the aid of a little distilled water. Cover the beaker, and heat on a water-bath until all of the metallic silver is dissolved, adding a little more nitric acid, if necessary. Filter into a flask, wash the insoluble residue thoroughly with distilled water, cool and dilute with distilled water, if necessary, to about 50 to 75 cc. Add 2 cc. of ferric ammonium sulphate T.S., and titrate with tenth-normal potassium thiocyanate V.S. Each cc. of tenth-normal potassium thiocyanate corresponds to 0.01079 Gm. of silver.

RESULTS.

Sample.	Per Cent of Silver.
Mild Silver-Protein, U. S. P.	19.15%
Silver Nucleinate, U. S. P.	18.87%
Silvol	19.89%
Solargentum	18.84%
Silver Nucleinate, not U. S. P.	21.72%
Lunargen	18.57%
Argyrol	19.75%

Modified U. S. P. X, Assay. (A).—Ignite about 1 Gm. of the Mild Silver-Protein, accurately weighed in a porcelain crucible, until all of the carbon is burned

off. Then moisten the residue in the crucible with 1 cc. of sulphuric acid and 5 cc. of nitric acid and 10 cc. of distilled water. Cover the crucible and digest for one-half hour on a water-bath. Filter the contents of the crucible into a flask and wash the crucible and residue on the filter paper with enough distilled water to make about 100 cc. Then add 2 cc. of ferric ammonium sulphate T.S., and titrate with tenth-normal potassium thiocyanate V.S.

RESULTS.

Sample.	Per Cent of Silver.
Mild Silver-Protein, U. S. P.	19.04%
Silver Nucleinate, U. S. P.	19.08%
Silvol	19.79%
Solargentum	19.08%
Silver Nucleinate, not U. S. P.	21.57%
Lunargen	18.72%
Argyrol	20.07%

Modified U. S. P. Assay for Silver. (B).—Removing Water-Soluble Ash.—Ignite about 1 Gm. of Mild Silver-Protein accurately weighed in a 50-cc. porcelain crucible until all of the carbon is burned off. When cool, add 30 cc. of distilled water and digest for $^1/_2$ hour on a water-bath. Then filter, and wash the crucible and residue into a filter paper with 70 cc. more of distilled water. The filtrate may be discarded. The residue and filter paper are then ignited in the same crucible until all of the carbon of the filter paper is burned off. The residue is then digested with 5 cc. of nitric acid in the same crucible, and then diluted with 10 cc. of distilled water, filtered into a flask and titrated with tenth-normal potassium thiocyanate V.S., using 2 cc. of ferric ammonium sulphate T.S., as an indicator.

RESULTS.

Sample.	Per Cent of Silver.
Mild Silver-Protein, U. S. P.	19.10%
Silver Nucleinate, U. S. P.	19.10%
Silvol	19.91%
Solargentum	19.10%
Silver Nucleinate, not U. S. P.	21.57%
Lunargen	18.68%
Argyrol	20.18%

In comparing the three assays the author prefers Modification B. In this assay all interfering substances are removed first and the silver is set free. Modification A gives results that are comparable with Modification B. Either assay apparently gives results that are closer than the present U. S. P. assay.

In concluding, the author suggests that the Revision Committee of the U. S. P. XI consider the inclusion of the following to the Monograph under Mild Silver-Protein:

1. A statement of moisture content.
2. A statement of ash content.
3. A revision of the allowable limits for silver.

Suggestion No. 3 is strongly recommended in view of the fact that the results obtained in 80 or 90 assays for silver on preparations of this type disclosed but one sample that contained over 21% of silver.

It is also suggested that the modified assays for silver be studied further and comparisons made with the present U. S. P. assay since the soluble chlorides present in these preparations interfere to some extent with the procedure of the latter assay

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MICROBIOLOGY VERSUS BACTERIOLOGY. PART II.

BY FANCHON HART.*

The curriculum content and teaching methods as set forth in a previous paper,[1] by the author, endeavored to differentiate between the aims and objectives of two related courses of study. In this paper I hope to make clear the specific advantages of each course to the student, the graduate and the pharmaceutical practitioner.

Although both bacteriology and microbiology are given at the College of Pharmacy of Columbia University and although our student body consists of candidates for the Ph.G. as well as for the B.S. degrees, our major purpose as a school of pharmacy is the adequate training for the retail dispenser of pharmaceuticals. For this reason I shall consider first, the course in Microbiology which is a compulsory subject for the prospective graduate in pharmacy.

Microbiology was introduced into the Ph.G. curriculum to meet the more recent needs for a knowledge of community hygiene and the prevention and control of the common communicable diseases.

The concept of the pharmacist educating the public is not of recent origin and its intrinsic value has long been recognized by the profession. A greater knowledge of prophylaxis has fortunately brought to the pharmacist additional opportunities for purposeful health guidance and demonstrations of worthy citizenship. A neighborly interest in the well-being of those he comes in contact with is easily recognized. Rapport having once been established, the confidence of the community is in the hands of the neighborhood druggist. It is within his power to improve sanitary conditions around him, both outside of, as well as within the homes, if he apply with sympathy and consideration the knowledge gained from the course in microbiology. This is more than a foundational, orientational or single subject-matter course. The establishment of desirable attitudes, the strengthening of personalities, and a wish to help human kind, are obvious results of the educational experiences gained from its broad social and economic relationship to life around us.

It is of the utmost importance to the pharmacist that he know the phenomenon of immunity; the Board of Health regulations concerning fumigation; incubation and quarantine. He can do much to establish and preserve sanitary conditions and by so doing, coöperate with the departments of health and sanitation.

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[1] Part I, 21 (1932), 675.

The Board of Health station not only lends prestige to the pharmacy, but bestows additional advantages for contacts with an ethical clientele. Closer coöperation with the physicians is the natural outcome for the pharmacist who can speak intelligently on professional topics of mutual interest. Accurate knowledge of, and statistical results pertaining to the newer biologicals is often welcome information to the busy physician. The modern pharmacist with an understanding of allergy, bacteriophage, vaccines and anti-body preparations is an asset to his community. An ever-anxious public will be relieved to get an intelligent answer to its many questions on preventive medicine. His knowledge of asepsis makes the pharmacist a more careful dispenser of eye lotions, hypodermic and intravenous solutions and, all in all, a more scrupulous and reliable practitioner than the pharmacist with only a limited understanding of sterilization.

For the student, the subject is of great interest. Although the course is intensive and represents a vast amount of material, the appeal to the members of the class is manifested by the magnificent enthusiasm with which their work is pursued. The demonstrations from the lecture platform as well as the individual experiments by the students, impart experiences that are at once inspirational and lasting. The action of bacterio-lysins, antitoxins, hæmolysins, the characteristics of normal and pathological blood, the changes brought about by bacterial and protozoal pathogens on the human body, the various methods of sterilization and the standard methods for water and milk examination, open up new fields of thought and interest to the members of the class. The student quickly realizes that the above topics are no longer a mystery to the layman of average intelligence, and the pharmacist cannot afford to overlook this important part of his profession.

Bacteriology with its special techniques and involved phenomena has a different appeal from that of its related science, microbiology, which nevertheless, is included in the more comprehensive study of bacteria. The student upon completion of his studies is prepared to enter a clinical or bacteriological laboratory and at the close of an apprenticeship, he is qualified to take the city or state examinations which give him the necessary credentials for the directorship of a bacteriological laboratory.

Other opportunities present themselves, such as bacteriological work for the water or milk laboratories, research bacteriologist in a biological laboratory or in any one of the great number of commercial fields with which this medical science has recently been associated. The industrial plants such as those dealing in furs, skins and raw hides, vegetable and animal fibres, manufacturers of canned goods, dairy products, flavoring extracts, condiments, etc., are ever in need of a bacteriologist to solve many of their problems. Another very important outlet for the knowledge obtained in this course is that of combining the diagnostic work with pharmacy. Many a successful pharmacist has established his reputation because of his excellent clinical laboratory which is so conveniently a part of his store. The small hospital and dispensary has likewise need for a person proficient in both pharmacy and bacteriology.

The possibilities for work in this field are ever increasing and those who can combine both branches of medical science, pharmacy and bacteriology, are happier for the experiences they enjoy, the social good they are capable of accomplishing, and the greater service they render to the medical practitioner and lay public.

TANNIN SPOT-TESTS.*

BY J. HAMPTON HOCH.

Of the many reagents recommended for the detection of tannins it is only reasonable to assume that a few are more sensitive than the others. To determine which reagents give positive results at great dilutions the following series of tests were made.

Four aqueous tannin solutions—gallotannic acid, gallic acid, catechutannic acid (prepared from Gambir), and the drug Kino—were freshly prepared with distilled water and were tested with thirty-three reagents.

In each case, five dilutions of the tannin solution were made—1:1000, 1:10,000, 1:100,000, 1:1,000,000, 1:10,000,000. One drop of each dilution was placed on a white porcelain spot-plate and a drop of the reagent was added to the test-drop.

Reagents 5, 19, 23, 24, 29, 33 gave no visible change in any case; reagents 20, 25, 30 being of limited value in dilutions as great as those used. The most sensitive general reagents for the different tannins seemed to be 2, 3, 7, 8, 15, 18, 26, 31.

The last-mentioned group of eight reagents was used in a series of tests on certain official, tannin-containing drugs. Each powdered drug (20 mg.) was macerated in cold distilled water (20 cc.) for 15 minutes, then filtered, and 1 cc. of the filtrate was diluted with 9 cc. water. A drop of this 1:10,000 dilution was treated on the spot-plate with a drop of the reagent. Results are tabulated in Table I.

The same reagents and the same dilutions (1:10,000) were employed in carrying out spot-tests on filter paper instead of the spot-plate. The results were for the most part similar to those obtained with the spot-plate, although the color changes were more difficult to interpret. In general the most satisfactory procedure was to permit the first drop to dry thoroughly before adding the second, thus reducing the degree of diffusion. Applying the reagent-drop to the dried test-drop was more satisfactory in some cases, *e. g.*, reagent 26; while in other cases, *e. g.*, reagent 18, best results were obtained by allowing the reagent-drop to thoroughly dry on the filter paper and then adding the test-drop.

List of Reagents:

1. 1% Ferric Sulphate
2. 5% Ferric Sulphate
3. 1% Ferric Acetate
4. 5% Ferric Acetate
5. 1% Mercuric Chloride
6. Saturated Potassium Dichromate
7. Saturated Potassium Dichromate plus trace of acetic acid
8. 1% Sodium Carbonate
9. 5% Sodium Carbonate
10. 1% Potassium Ferricyanide plus equal volume 1% NH_4OH
11. 1% Ammonium Molybdate in nearly saturated solution of NH_4Cl
12. 1% Lead Acetate (neutral)
13. 1% Lead Acetate (basic)
14. 1% Copper Acetate
15. 5% Copper Acetate
16. 1% Chromic Acid in dilute H_2SO_4
17. 1% Ferric Chloride (neutral)
18. Saturated Calcium Hydroxide
19. 1% Caffeine
20. 1% Antipyrine
21. 1:500,000 Methylene Blue
22. 1% Gelatin
23. 1% Amygdalin
24. Starch Test Solution, U. S. P. X
25. Saturated Quinine Sulphate
26. Nessler's Solution
27. 1% Iodine in 1.5% KI. Test-drop first made faintly alkaline (NH_4OH)
28. 10% Stannous Chloride in conc. HCl
29. Bromine Water
30. 1% Potassium Antimonyl Tartrate
31. 1% Potassium Cyanide
32. 1% Ferric Alum
33. 1% Albumin

* Scientific Section, A. PH. A., Toronto meeting, 1932.

TABLE I.

1:10,000 Dilution.	2.	3.	7.	8.	15.	18.	26.	31.
Galla	Dark blue ppt.	Dark brown ppt.	Orange-brown with slight ppt.	Yellowish brown; ppt. slight	Greenish brown ppt.; liquid blue-green	Brownish red ppt.	Greenish brown ppt.	Orange-brown color
Kino	Cadet gray ppt.	Brown ppt.	Orange-brown with ppt.	Rose color; ppt. slight	Greenish brown ppt.; liquid blue-green	Rose-red ppt.	Dark brown ppt.	Rose color; slight ppt.
Rhus Glabra	Pale bluish color	Brown; slight ppt.	.....	Very pale straw color	.....	Very pale pink color	Light yellow-brown; slight ppt.	.....
Castanea	Blue-violet; ppt. slight	Lighter brown color and ppt.	.....	Slight apricot color	Blue-green color; ppt. very slight	Slight rose ppt.	Ochre ppt.	Slight apricot color
Rosa	Bluish black ppt.	Brown ppt.	Brownish orange color (hardly significant)	Straw color	Blue-green color; ppt. slight	Reddish brown ppt.	Ochre ppt.	Straw color
Hamamelidis Folia	Light gray color	Light brown color; ppt. slight	.....	Pale straw color	.....	.....	Dark brown ppt. (slight)	.....
Gambir	Green-gray color and ppt.	Brown; ppt. slight	Brownish orange color; ppt. slight	Apricot color; to brownish orange	Green color; ppt. slight at first	Brownish orange ppt.	Dark brown ppt.	Brownish orange; slight ppt.

Experiments with greater dilutions of these drugs gave reactions with both the filter paper and spot-plate method; the depth of color depending on the concentration of the test-drop.

The simplicity of the tests and the facility with which they can be carried out render them worthy of consideration for inclusion in the revised monographs of the official drugs which are used primarily because of their tannin content. Because these spot-tests are indicative of the tannin content of the drugs in question we would suggest the determination of the most satisfactory reagent for each of them, as well as the limiting concentration of the respective drugs which will respond with a significant reaction, the data to be incorporated in a statement appended to the drug monograph.

Ferric sulphate was chosen, because of the marked color change yielded by its reaction with an aqueous nutgall solution, for the following experiments in which the influence of certain variable factors—temperature, time, adsorption—were investigated.

Four portions of powdered nutgall (200 mg. each) were placed in beakers and three were allowed to macerate for twenty minutes with 20 cc. of water. The temperatures of the portions were, respectively, 26.5° C. (chilled), 30.5° C. (room temperature), 53.0° C. (heated). The fourth portion was boiled for twenty minutes with 20 cc. of water, the volume being kept nearly constant during that time. All portions were then filtered through paper previously moistened with water, the volume of the fourth portion being made up to 20 cc. by slight washing of the filter. One cc. of each filtrate was then diluted with 99 cc. of water to make 1:10,000 dilutions. Subsequent testing on the spot-plate with the ferric sulphate reagent revealed no perceptible difference in the depth of color yielded by the various portions. Greater dilutions (up to 1:50,000) also showed no difference. Beyond this point no darkening could be distinguished.

To investigate the effect of the time of maceration, five portions (200 mg. each) of the powdered drug were macerated with water (20 cc.) at room temperature (29° C.) for periods of 5, 10, 15, 20 and 30 minutes, respectively. Dilutions of 1:10,000 were prepared as before and again no difference was noted upon testing. The end-point of the test was reached at 1:50,000 dilution.

The possibility of adsorption during the filtration after maceration was examined by preparing two 1:10,000 dilutions under the same conditions (200 mg. drug; 20 cc. water; 29° C.; 20 minutes), excepting only that filtration was omitted in one case and a dry filter was used in the other. Again there was no distinguishable difference in their reactions at any dilution, and again the end-point was found to be at 1:50,000 dilution.

Allowing the reagent and the drug dilutions to age from two to four days decreased the sensitivity of the reactions in every case.

The most satisfactory method of procedure was found to be: Carefully weigh 200 mg. of the very fine drug powder and place in a beaker containing 20 cc. of distilled water. Agitate occasionally, and after a minimum of five minutes has elapsed, filter through a paper previously moistened with distilled water. Prepare the dilution indicated by adding the requisite amount of distilled water to 1 cc. of the filtrate. After thorough mixing, place one drop of the dilution on a white, porcelain spot-plate and add a drop of the reagent solution.

Conclusions.—Various tannin reagents show a wide range of sensitivity when applied to dilute aqueous solutions of tannins in spot-tests.

Neither the time of maceration (within a 5- to 30-minute range), nor the temperature of the water used in maceration, nor the filtration of the extract are significant factors in altering the positiveness with which a dilute aqueous extract of a very fine drug powder will respond to selected tannin reagents.

Solutions must be freshly prepared with distilled water for best results.

SUMMARY.

Thirty-three reagents were tested to determine their sensitivities toward aqueous tannin solutions in spot-tests. The reactions of eight reagents on aqueous dilutions of seven official drug powders are tabulated. Spot-plate and filter paper methods are described and compared. Spot-tests are useful in evaluating tannin content and they are recommended for inclusion in the revised monographs of certain official drugs. After consideration of some variable factors, a method of procedure is described.

FROM THE WILDS OF THE FOREST TO YOUR FINISHED PRESCRIPTION
GATHERING
STORAGE
PERCOLATION
FLUID EXTRACT
YOUR PRESCRIPTION
Some of the WORKING TOOLS of the Profession
RETORT CONDENSER
Pharmacy is both AN ART and A SCIENCE
Some STANDARD BOOKS on Professional Pharmacy

The National Pharmacy Week Prize-Winning Window.—The window shown above is the prize-winning window, and the successful contestant is John O'Brien Drug Store, Omaha, Neb. Only apparatus and material from the stock and laboratory were used—the background was built for the window and colored by an artist. The pharmacist shown in the prescription room is Kenneth O'Connor. The photograph presents its story very well for, evidently, it impressed the Committee. The chairman of the latter is Frank East, of Boston; the donor of the Prize Cup is the Federal Wholesale Drug Company.

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THE ALCOHOL CONTENT OF SYRUP TOLU, U. S. P.*

BY C. W. BALLARD AND REGINALD MILLER.

It is a common practice in retail pharmacy to use various tolu concentrates for the preparation of Syrup Tolu and the manufacturers of these concentrates usually include, as part of the labeling, formulæ for the manufacture of the syrup. These formulæ state that the resulting product will be Syrup Tolu and in certain instances the legend U. S. P. specifically appears. It is not unreasonable for the practicing pharmacist to expect that by following the formula he will obtain a Syrup Tolu which corresponds to the pharmacopœial requirements, but this expectation is not always realized.

* Section on Practical Pharmacy and Dispensing, A. PH. A., Toronto meeting, 1932.

Laboratory examination of samples of Syrup Tolu from retail pharmacies in the City of New York shows frequent deviation from the official requirement regarding alcohol content. A further investigation shows that a concentrated tolu was used as the basic material in many of these deficient samples. A possibility of deviation from formula was eliminated by securing concentrates of several reputable manufacturers, preparing the syrup according to stated formula and assaying the resulting preparation for alcohol content. As will be apparent in the following tabulation, these syrups showed an alcohol content uniformly lower than the 3.5 to 4.5% by volume specified by the U. S. Pharmacopœia X.

TABLE I.

Soluble Tolu Preparations.	Labeling.	Formula for Syrup Tolu.	Alcohol Content of Preparation Resulting.
Manufacturer "A"	Fluid Tolu Soluble Alcohol 20%	Use 1/2 fld. oz., add simple syrup *q. s.* 16 fld. oz.	1.8%
Manufacturer "B"	Alcohol 20%	Use 2 fld. oz, add simple syrup *q. s.* 23 fld. oz.	Less than 3.5%
Manufacturer "C"	Alcohol 25%	Use 40 cc. and 460 cc. simple syrup	Less than 3.5%
Manufacturer "D"	Alcohol 20%	Use 42 cc. and simple syrup *q. s.* 500 cc.	Less than 3.5%
Manufacturer "E"	Fluid Tolu Soluble Alcohol 24% (Artificial Color)	Use 30 cc. and 450 cc. simple syrup	1.5%

From a therapeutic standpoint these deviations from the official alcohol content may not be of importance but the fact remains that official specifications have a legal aspect. The retail pharmacist is held responsible for the quality of medicinal preparations he sells and regulatory authorities are legally bound by the official specifications. In certain instances the specifications may be interpreted in such a manner as to permit variation, but the official statement of maximum and minimum limits for alcohol in this preparation does not admit of much variation.

There appears to be no reason why the manufacturers of these concentrated tolu preparations cannot give the pharmacist a formula which will produce a preparation meeting all official requirements. Failure to do so will result in a continuance of a petty type of violation which is annoying to the pharmacist and more so to regulatory officials.

CHEMICAL LABORATORY, BUREAU FOODS AND DRUGS,
HEALTH DEPARTMENT, NEW YORK CITY.

SOME PRESCRIPTION INCOMPATIBILITIES.*

BY S. L. HILTON.

In presenting the following prescriptions I am in hopes of bringing out some difficulties, some of which I have been able to solve and several others not. If the physician had better training or more properly speaking any training in prescription writing and incompatibilities, or would consult the pharmacist, he would obtain better results and most of the incompatibilities would be eliminated.

* Section on Practical Pharmacy and Dispensing, A. PH. A., Toronto meeting, 1932.

No. 1, ℞

Cocaine hydrochloride	grains v
Solution neosilvol 20%	ʒ ss
Solution ephedrine 3% *q. s.*	ʒ i

This prescription cannot be filled, neosilvol is an iodide of colloidal silver; the alkaloids are precipitated.

No. 2, ℞

Acid salicylic	ʒ ii
Sodium bicarbonate	*q. s.*
Tr. ferric chloride	ʒ iii
Acid citric *q. s.*	
Aromatic elixir	ʒ ii
Distilled water *q. s. ad*	ʒ vi
Misce.	

Dissolve thirty grains of citric acid in the tincture of ferric chloride and add one fluidounce of aromatic elixir. To the salicylic acid add two drachms of sodium bicarbonate and one fluidounce of aromatic elixir, then mix the two solutions; the result is a dark wine-colored mixture without precipitation.

I have had quite a controversy over the method given above, the method followed by the pharmacist is to make the sodium salicylate mixture, add the tincture of ferric chloride. A rusty brown precipitate is formed, to this he adds a small quantity of aqua ammonia—sufficient to dissolve; he then completes the prescription. I maintain that if a prescription can be compounded without adding anything not ordered or omitting something prescribed—no change should be made without the consent of the physician.

No. 3, ℞

Calcium lactate	15.0
Dionin	0.1
Simple syrup	15.0
Distilled water *q. s.*	180.0
Misce et Sig: Tablespoonful every three hours.	

This prescription was compounded and dispensed in a screw-cap bottle; the patient took part of it and the remainder was left on a mantel in a heated room for twenty-one days, when the preparation exploded—I was asked the reason. Calcium lactate is an acid salt, the prescription contains 8 per cent of syrup or about 4 per cent sucrose, the slightly (lactic) acid condition with heat changed the sucrose to invert sugar; fermentation developed, carbon dioxide and alcohol were formed. If the prescription had been dispensed in a corked bottle, instead of a screw-cap bottle, the cork would have been blown out; the bottle could not stand the pressure, consequently it was blown to pieces.

No. 4, ℞

Zinc chloride	grains iv
Dobell's solution	ʒ iii
Misce et Sig: Use as a mouth wash.	

It cannot be compounded so that the finished product contains any zinc chloride, for the reason that the sodium borate in the Dobell's solution precipitates zinc borate, an insoluble complex compound.

No. 5, ℞

Sodium salicylate	ʒ vi
Sodium bicarbonate	ʒ vi
Aquæ gaultheria q. s. ad	ʒ vi
Misce et Sig: ʒ ii p. c.	

This prescription contains more sodium bicarbonate than will dissolve in the quantity of water ordered (solubility 1 in 20). The pharmacist desired to know why the solution turned black in a day or two. To avoid this change, there is but one make of sodium salicylate obtainable that does not change; this is physiologically tested. Small traces of phenol in the sodium salicylate is the cause of the darkening.

No. 6, ℞

Ephedrine sulphate	0.90
Anesthesin	0.60
Distilled water *q. s. ad*	30.00
Misce et Sig: Apply to tongue every 3 or 4 hours.	

Anesthesin is insoluble in water, a few drops of diluted hydrochloric acid renders it soluble. Ephedrine hydrochloride should be used instead of the sulphate, make two separate solutions and mix them.

No. 7, ℞

Sodium nitrite	
Sodium iodide *a a*	grains iiss
Make 20 such capsules.	
Sig: One three times a day as directed.	

Free iodine is liberated, the two salts cannot be dispensed in the same capsule.

No. 8, ℞

Betanapthol	grains viii
Precipitated sulphur	ʒ i
Alcohol	ʒ iv
Sat. sol. zinc sulphate	
Sat. sol. pot. sulphurat, of each to make	ʒ iv
M. Make a paste.	

It is easy enough to make a saturated solution of zinc sulphate, the solubility is given in the U. S. P. Nowhere could I find the solubility of sulphurated potassa, consequently had to work it out. One part is soluble in 0.8 parts of water.

Add the saturated solution of sulphurated potassa slowly to the saturated solution of zinc sulphate with constant stirring; when effervesence ceases add the other ingredients, previously mixed, to a large portion of the zinc sulphide mixture and make same weigh ʒ iv.

No. 9, ℞

Acetylsalicylic acid	ʒ i
Amidopyrine	grains xl
Sodium bicarbonate	ʒ ss
Mix and make twenty capsules.	

Acetylsalicylic acid is incompatible with sodium bicarbonate and should be omitted.

No. 10, ℞

Sodium salicylate	ʒ i
Calcium bromide	ʒ ii
Sol. potass. hydrox.	ʒ i
Elix. peptenzyme *q. s.*	ʒ iv

Misce et Sig: Teaspoonful in water every 3 hours.

Why liquor potassa was added is beyond my understanding—calcium hydroxide is formed, which is insoluble in the mixture. Elixir peptenzyme contains pepsin, which is destroyed in alkaline mixtures.

THE LAXATIVE PROPERTIES OF RHAMNUS ALNIFOLIA.*

A PRELIMINARY REPORT.

BY ALVA COTTON AND L. K. DARBAKER.

During one of the annual botanical expeditions to the Pymatuning swamp, Professor O. E. Jennings, Head of the Department of Botany of the University of Pittsburgh and Carnegie Museum, called the attention of one of the writers to *Rhamnus alnifolia*, which grows abundantly in some parts of the swamp.

The shrub *Rhamnus alnifolia* differs but little from the general description of the shrubs of the *Rhamnaceæ*. It is a low-growing shrub, inhabiting swamps from Maine to Pennsylvania, Illinois and northward. The leaves are ovate, with an acute apex, serrate margin and almost straight-veined. The shrub flowers in June; the flowers are small, inconspicuous and of a greenish color. The fruit is drupe-like, three-seeded and blackish in color.

As this plant is related to Cascara Sagrada, it was suggested that it might have similar laxative properties and, if so, perhaps be used in the same manner as Cascara Sagrada. During the summer of 1930 and 1931 bark and leaves were collected, dried and made into fluidextracts, without aging.

After some experimentation upon animals, the fluidextracts were tried upon humans. It was demonstrated that the fluidextracts made from the bark of *Rhamnus alnifolia* produced laxative and cathartic actions similar to those produced by Cascara Sagrada but approximately twice as much was necessary to produce the same results as with the Cascara Sagrada.

The leaves also contain laxative principles but in such small amounts as to render the fluidextract unsatisfactory for human use.

From these preliminary experiments it would seem that the bark of *Rhamnus alnifolia* could be used in the same manner as that of Cascara Sagrada, with the disadvantage of a larger dose but with the advantages of less griping and it not being necessary to age the bark.

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* Scientific Section, A. PH. A., Toronto meeting, 1932.

First Aid Week, March 12th–19th, should mean a week of service. Advise your patrons of the necessity of care and the purpose of a label on medicines.

RELATIVE VALUE OF SLOW AND FAST PERCOLATION IN PREPARING TINCTURE OF RHUBARB AND AROMATIC TINCTURE OF RHUBARB U. S. P.*

BY V. L. DICKEY.

This work was undertaken at the request of the Revision Committee, U. S. P., to obtain information regarding the extraction of Rhubarb, the principal object being to determine the best method of percolation. In connection with such a problem, the question arose, "How long should the period of maceration extend and how rapidly should the drug be percolated in order to remove the emodin bodies, leaving behind those principles which tend to precipitate on standing."

Tinctures were prepared in order to determine the relative value of long and short maceration along with slow and fast percolation, these preparations consisting of three Tinctures of Rhubard, 1000 cc. each, and the same number and quantity of Aromatic Tincture Rhubarb. The menstrua used in all extractions were U. S. P. X (glycerin, 100 cc., alcohol, 500 cc., water, 400 cc.) as menstruum No. 1 and (alcohol, 1 vol., water, 1 vol.), as menstruum No. 2. The time of maceration and rates of percolation were varied so as to find an effective method of extracting the emodin bodies from the drug, leaving the tannoids behind. The following table shows the schedule carried out in each experiment.

TABLE I.—TINCTURE RHUBARB.

Drug.	Menstruum.	Time of Maceration.	Rate of Percolation.
A (Rhubarb, 200 Gm.)	1—Glycerin, 100 cc.; alcohol, 500 cc.; water, 400 cc.	24 hours	0.5 cc. per minute
	2—Diluted alcohol		
B (Rhubarb, 200 Gm.)	(Same menstruum as A)	6 hours	2.0 cc. per minute
C (Rhubarb, 200 Gm.)	(Same menstruum as A)	3 hours	4.0 cc. per minute

TABLE II.—AROMATIC TINCTURE RHUBARB.

Drug.	Menstruum.	Time of Maceration.	Rate of Percolation.
D (Rhubarb, 200 Gm.) (Cardamon Seed, 40 Gm.) (Clove, 40 Gm.) (Nutmeg, 20 Gm.)	1—Glycerin, 100 cc.; alcohol, 500 cc.; water, 400 cc.	24 hours	0.5 cc. per minute
	2—Diluted alcohol		
E (Same drug as D)	(Same menstruum as D)	6 hours	2.0 cc. per minute
F (Same drug as D)	(Same menstruum as D)	3 hours	4.0 cc. per minute

During the percolation of the tinctures, intermediate 5-cc. samples of percolate were taken when 250 cc., 500 cc., 750 cc. and 1000 cc. of percolate had been withdrawn from the drugs. These samples were taken so as to determine the comparative exhaustion (by presence of emodin bodies) of the drugs at different stages of percolation.

An investigation of the literature on the determination of the anthraquinone derivatives in cathartic drugs, revealed that none of the tests was very reliable. It was decided, however, that the method used in conducting the color tests for the presence of emodin bodies in the tinctures was sufficiently accurate to estimate the relative exhaustion of the drugs.

* Section on Practical Pharmacy and Dispensing, A. PH. A., Toronto meeting, 1932.

The test based on the U. S. P. X identity test for Rhubarb was as follows:

To 1 cc. of the intermediate sample of tincture was added 9 cc. of solution potassium hydroxide (1 Gm. of 100% in 100 cc. water). This mixture was shaken, acidulated with HCl, allowed to cool and filtered. (A precipitate formed on adding the HCl, which was insoluble in ether.) The acid filtrate was shaken out with 10 cc. of ether, the ether layer becoming yellow on standing. The ethereal solution was shaken out with 5 cc. of ammonium hydroxide test solution. The ammonium hydroxide layer turned red showing a presence of emodin bodies and the ether layer remained yellow (chrysophanic acid).

TABLE III.—RESULTS OF TESTS FOR EMODIN BODIES IN INTERMEDIATE SAMPLES.

	250-Cc. Stage in Percolation.	500 Cc.	750 Cc.	1000 Cc.
A	Deep red	Light red	Pale red	Faint red
B	Red	Light red	...	...
C*	...	Deeper than A	Light red	Faint red

* Practically no difference in depth of color at corresponding stages.

The test used to determine the emodin bodies in the intermediate samples was also used for the finished tinctures.

TABLE IV.—EMODIN BODIES IN FINISHED TINCTURES.

Tinctures	A, B, C	Same depth of color.
Aromatic tinctures	D, E, F	Same depth of color but lighter than A, B and C.

Tests were also run on portions of the same tincture; one portion was thoroughly shaken to insure a uniform mixture, and the other portion was one from which the precipitate had entirely separated, having been standing undisturbed for one month. Depth of color in each test was practically the same.

TABLE V.—RESULTS OF TOTAL SOLIDS DETERMINATION IN TINCTURES.

Tincture Rhubarb.

A	18.63 Gm. per 100 cc.
B	18.36 Gm. per 100 cc.
C	18.755 Gm. per 100 cc.

Aromatic Tincture Rhubarb.

D	18.84 Gm. per 100 cc.
E	19.26 Gm. per 100 cc.
F	19.655 Gm. per 100 cc.

The following results were obtained as to relative depths of color of the finished tinctures: in the plain tinctures, A was the deepest in color, C next and B the lightest. In the aromatic tinctures, D had the greatest depth of color, F next and E was lightest.

TASTE COMPARISONS.

Results given by four observers, as to strength of tinctures, were not very definite.

TABLE VI.

Tincture.	Observers. 1. 2. 3. 4.	Aromatic Tincture.	Observers. 1. 2. 3. 4.
Strongest	C C C B	Strongest	D F D E
Next strongest	B B A A	Next strongest	E E E D
Weakest	A A B C	Weakest	F D F F

Per Cent Residue in Tinctures after Standing 8 Months.

Tincture Rhubarb	A 0.6 %	*Aromatic Tincture Rhubarb*	D 0.64%
	B 0.4 %		E 0.8 %
	C 0.36%		F 0.7 %

CONCLUSIONS.

1. The color tests (for emodin bodies) on the intermediate samples indicated that long maceration (24 hours) and slow percolation (0.5 cc. per minute) as in Experiment A, gives more rapid extraction of active principles, this percolate showing a greater quantity of emodin bodies at 250 cc. than B and C. Tests for emodin bodies in B (maceration, 6 hours—percolation, 2 cc. per min.) and C (maceration, 3 hours—percolation, 4 cc. per minute) appeared about the same at the corresponding stages of percolation, showing there was no particular advantage of one over the other in regard to time of maceration and rate of percolation.

2. Long maceration followed by slow percolation exhausts the drug with a smaller amount of menstruum than fast percolation, but the quantity of menstruum passed through each drug seemed sufficient to guarantee complete extraction, even with a short maceration period and fast (4 cc. per min.) percolation. This fact is borne out by the results obtained on testing for emodin bodies in the finished tinctures.

3. The results of the color tests were practically identical when performed on portions of the same tincture, one portion having been thoroughly shaken to insure a uniform mixture and the other portion being one from which the precipitate had entirely separated, having been standing undisturbed for one month. In the latter sample the quantity of tincture necessary for the emodin test was taken from the supernatant liquid. This result in the color test comparison indicates that no emodin bodies separate out with the residue.

4. The results in extraction for the Tincture of Rhubarb and the Aromatic Tincture of Rhubarb are practically the same. Little variation was observed in the samples in each series as to depth of color, taste, total solids, active principles in finished tinctures, and amount of residue after aging 8 months.

5. It appears that there is no outstanding value of long maceration and slow percolation over short maceration and fast percolation in preparing Tincture Rhubarb and Aromatic Tincture Rhubarb.

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TINCTURE OF CAPSICUM.

BY V. L. DICKEY AND F. W. NITARDY.

EFFECT OF VARIATIONS OF ALCOHOLIC STRENGTH OF MENSTRUUM AND RATE OF PERCOLATION ON THE QUALITY OF THE TINCTURE OBTAINED.

Seven Tinctures of Capsicum were prepared from the same lot of drug, using different menstrua, macerating for different periods and percolating at various rates of flow in an effort to determine the best menstruum and procedure for percolation. The experiments were conducted as indicated in the following table, 1000 cc. of tincture being made from 100 Gm. of drug in each case.

TABLE I.—TINCTURE OF CAPSICUM.

Experiment.	Menstruum.	Percolate Collected.	Time of Maceration.	Rate of Percolation.
A	Alcohol 95 vol. Water 5 vol.	1000 cc.	24 hours	0.5 cc. per min.
B	Alcohol 9 vol. Water 1 vol.	1000 cc.	24 hours	0.5 cc. per min.
C	Alcohol 4 vol. Water 1 vol.	1000 cc.	24 hours	0.5 cc. per min.
D	Alcohol 95 vol. Water 5 vol.	1000 cc.	3 hours	4.0 cc. per min.
E	Alcohol 4 vol. Water 1 vol.	1000 cc.	3 hours	4.0 cc. per min.
F	Alcohol 9 vol. Water 1 vol.	750 cc. (Made up to 1000 cc. by addition of alcohol.)	3 hours	4.0 cc. per min.
G	Alcohol 4 vol. Water 1 vol.	450 cc. (Made up to 1000 cc. by addition of alcohol.)	3 hours	4.0 cc. per min.

Organoleptic (taste) tests were run on each tincture in order to determine the comparative strength. The tinctures are listed as follows in the order of their relative pungency and the dilutions necessary to yield solutions of equal pungency and the % strength figures for pungency are also given, based on rating tincture C as 100%. Determinations were also made for the amount of total solids in the tinctures and the per cent of fat in the dried marcs.

TABLE II.

Tincture.	Required Dilution for Equal Pungency.	% Strength (C = 100).	Total Solids in Tinctures.	% Fat in Dried Marcs.
C	1—2380	100.00	0.2447 Gm.	1.26
B	1—2325	97.69	0.2150 Gm.	1.07
D	1—2175	91.39	0.2044 Gm.	0.910
A	1—2000	84.03	0.1991 Gm.	0.888
F	1—2000	84.03	0.1915 Gm.	2.25
G	1—1900	79.83	0.1907 Gm.	2.22
E	1—1780	74.79	0.1796 Gm.	1.45

The dried marcs were tasted in order to note if pungent principles remained after extraction. It was found that D, F, G had retained some pungency, F being more pungent than G, and G more than D. No evidence was available which would explain why no pungent sensation was produced by marcs A and E, as tincture A was the same as F and tincture E was less than F and G in % strength, which would indicate that all of the pungent principles had not been extracted.

In the color comparison carried out, the tinctures were rated according to their relative depths of color, starting with the darkest tincture: C, E, B, D, F, G, A. This does not coincide with the order of rating based on either total solids or pungency. It shows color is extracted almost as well with a weaker alcoholic menstruum, brief maceration, and rapid percolation as under conditions which yield more complete extraction of the active principles; the weakest tincture in the above table taking second place in color intensity. However, the variation in color between the several tinctures was not great and no change was noticeable therein, after standing 10 months at room temperature in amber bottles.

The following results were obtained from the periodic examinations of the tinctures of sediment. The sediment in each sample had about the same physical properties, being very fine and white.

TABLE III.—SEDIMENTATION OF TINCTURES.

	Age of Tinctures at Observation.					
	1 Month.	2 Months.	3 Months.	4 Months.	6 Months.	10 Months.
Tincture C	++	++	+++	+++++	+++++	++++++
Tincture B	—	—	+	++	++	+++
Tincture D	—	—	++	+++	+++	++++
Tincture A	+	++	++	+++	+++	+++
Tincture F	+	+	+	+	+	++
Tincture G	—	+	+	+	+	+
Tincture E	++	++	+++	++++	++++	+++++

— indicates no sediment.

+ indicates slight sediment which is the least.

++++++ indicate the most sediment. The difference between the two extremes is not great.

When the tincture was disturbed the sediment became suspended throughout the tincture. Most of it was ether soluble, but practically insoluble in a mixture of alcohol, 4 vol.—water, 1 vol. After the sediment in bottom of the bottle was subjected to treatment with ether and later with alcohol, 4 vol.—water, 1 vol., some of it still remained, it not being soluble in either solvent. The ether solution was clear, and on evaporation left a gray, greasy residue.

CONCLUSIONS.

1. A menstruum of alcohol, 4 vol.—water, 1 vol. is most effective in extracting the pungent principles.

2. Adequate maceration and slow percolation is necessary for complete extraction.

3. All tinctures made in the experiments discussed showed slight sediment on standing 10 months, consisting mostly of fat. The quantity present in any tincture is very small, careful examination of the product being required to disclose its presence.

4. Less effective extraction methods also extracted less fat, yielding tinctures showing slightly less sedimentation on aging.

PHARMACEUTICAL & CHEMICAL LABORATORIES,
E. R. SQUIBB & SONS,
BROOKLYN, N. Y.

THE DENTIST AND THE PHARMACIST'S OPPORTUNITY FOR PROFESSIONAL SERVICE.*

BY GEORGE C. SCHICKS.[1]

Chaotic business conditions of the past two years have demonstrated the need for sound business organization. Slipshod business methods, marketing of commodities for which there is little demand, lack of aggressive merchandising and a host of other unbusinesslike procedures, point very clearly to the fact that a business established in such a manner cannot long withstand the ravages of economic distress.

However, even though there is business distress on every side and competition is daily becoming a more serious problem, even though profits may be less and daily sales smaller, there is still a place for optimism—there is still a way out.

Real business security for pharmacists in these days of vicious competition can come in but one way—in the further development of the professional aspect of their services. In that aspect they alone in this whole retail business world, are equipped by training and licensed by law to carry on their professional services. No cigar store, no cosmetic shop, no cafeteria, no variety store, no lunch wagon can rob them of their licensed right to compound prescriptions.

That licensed right of which I speak is the sole reason for the existence of every drug store in this country.

It must be realized that pharmacists are an essential link in the chain which necessity has forged to bind up the wounds of man. That's their job!

Why, then, don't they make every effort to build up the professional phase of their business? Some phase of commodity merchandising is essential in all stores. This must be done efficiently and legitimate profits made, but priceless time must not be spent worrying about how many cigars the store across the street sells. By selling cigars pharmacists have made themselves competitors of 33,381 cigar stores, 62,648 candy stores, 7643 news dealers and many others, all selling cigars in this country. Selling lip sticks makes them competitors of cosmetic shops. Selling sandwiches makes them competitors of 62,648 candy and soda fountain establishments, and 135,674 eating places, not including hotels and countless roadstands.

When pharmacists know, then, that they are one of only 100,000 registered pharmacists in this country of 122,775,000 souls; that there is one drug store for every 2125 persons in this country; that 57,716 drug stores in one year did one billion, six hundred eighty-four million dollars worth of business; that the independent business which depends largely on the scale of commodities for its existence is the business which, with the increase in competition in commodities, is the business which will suffer the most; that as the majority of drug stores are organized to-day that real competition comes in the commodity phase of business; when they know the real reason for the existence of drug stores lies in the fact that they are trained and licensed to carry on a profession—when they know all these things to be true, why, then, don't they set themselves about the business of being honest to goodness pharmacists?

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* Section on Practical Pharmacy and Dispensing, A. PH. A., Toronto meeting, 1932.

[1] Assistant Dean, Rutgers University, College of Pharmacy.

The St. Louis Survey uncovered in its multitude of facts one very significant fact which I am going to bring to your attention. Quoting from Wroe Alderson's report:

"The retail drug trade, with a few notable exceptions, does not engage in aggressive merchandising, and hence is not fully capitalizing its opportunities for the creation of demand."

I may also add that the retail drug trade does not engage in aggressive merchandising of its professional service in its prescription department.

What did the Department of Commerce find out pharmacists do to get business? It found out that the great majority of them stand in their stores and wait for business to come to them. Is that creating a demand for either their merchandise or their services?

How many times does a salesman enter a store? If his firm is given an order for its merchandise, does he take the order and then forget that that pharmacist is in business? Men in business know that if a firm is given an order that firm will keep in touch with its customer until it gets either additional orders or a final refusal of a re-order, and if it gets a final refusal it isn't going to take that business establishment long to find out what is wrong with either its service or its product—and in order to keep in business it has to make that wrong, right.

What would happen were pharmacists to use similar methods to get business for themselves? What would happen were they to increase their professional service—which brings me to the subject of this paper.

In the introduction to this paper I have called attention to the fact that real business security for the man in the retail drug stores lies in the further development of the professional aspect of his services. There the field is narrowed down to professional groups from which he may expect to obtain increased business. I shall give my attention to but one specific group, namely, the dental profession. There is no professional group to-day more eager to be told the truth about drugs and preparations which have real merit than the dentists. The best minds in the dental profession are pointing out the advantages of using drugs which the medical profession have proven as standard recognized therapeutic agents. They are pointing out the advantage of prescribing U. S. P. and N. F. official drugs and those listed in the New and Non-Official Remedies, published by the American Medical Association. The American Dental Association is encouraging at every opportunity the use of official drugs—could there be a better opportunity for the pharmacist to step in and enlarge his field of professional service?

There are 67,000 dentists in the United States who prescribe drugs in a limited way. There are no statistics available which show how many of these dentists dispense their own prescriptions. This data is being determined by Rutgers University College of Pharmacy, and will be reported upon at a later date. I feel rather certain, however, that the number will be small.

Many dentists prescribe by word of mouth, telling their patients to get a bottle of this or a box of that at some drug store they pass on the way home. Almost always, too, the dentist gives them a sample of some kind to relieve a painful extraction or treat some oral condition. These samples are usually left by salesmen of proprietary dental remedies. This method of advertising, employed by dental proprietary manufacturers who sell products with false claims, is not only

exploiting the dental profession but it is fostering the habit of self-medication—a practice which is neither fair to the dentist nor to his patient.

In a campaign to gain the business of the dentist the pharmacist should thoroughly familiarize himself with the requirements of the dentist in his daily practice. It is quite necessary that the pharmacist know the different branches of specialization in dentistry so that he can foresee the needs of the dental specialist and talk intelligently with him.

A dentist may be a general practitioner or he may specialize in one or more of the following branches of dentistry:

1. *Orthodontia*, or the correction of irregularities of the teeth.
2. *Oral Surgery*, or the operative dentistry and extractions.
3. *Peridontia*, or the treatment of diseased conditions of the tissues adjacent to the teeth.
4. *Oral prothesis*, or the replacement of missing parts by artificial substitution.
5. *Radiodontia*, or X-ray studies of the teeth and adjacent tissues, including diagnosis.
6. *Dental medicine*, or preventive dentistry.

To aid the pharmacist who desires to increase the professional part of his business by obtaining the support of the dental profession the following formulas may be valuable. Through the coöperation of Rutgers University College of Pharmacy, the National Association of Retail Druggists is publishing a booklet on U. S. P. and N. F. Drugs and Preparations, which will be available at cost. The expense of presenting one to each dentist in a neighborhood without charge will be negligible. This will give pharmacists an excellent opportunity to call on the dentists and to become acquainted.

FORMULAS.

The first formula presented is for a *Tooth-Paste Base*. This paste may be used as a base for the incorporation of many medicaments such as antiseptics, germicides and astringents used in oral hygiene or in the treatment of oral diseases. Such a base affords the dentist an opportunity to prescribe the medication he wants and in the strength he desires, as governed by the pathological condition of the patient. He may also have added a flavor acceptable to the patient and a color to add attractiveness to the paste.

The dentist does not have available to him at the present time a medicated tooth-paste in which the strength of the medication is governed by the pathological condition of the patient.

It would be unfortunate if this formula should be interpreted as another tooth-paste on the market to be sold to any one over the counter. This tooth-paste should be dispensed only on the prescription of the dentist. This is a professional service pharmacists are rendering to the dentist. The value of medication in tooth-pastes is questionable but millions of tubes of medicated pastes are sold each year and dentists do suggest their use. If any medicated tooth-paste has therapeutic value, such action as it may have should be made to meet the condition of the disease treated. The disease should not be made to fit the medication in the tooth-paste, but the tooth-paste should be made to meet the requirements of the patient.

TOOTH-PASTE BASE.

Precipitated calcium carbonate	55.25 Gm.
Powdered castile soap	6.00 Gm.
Glycerin	34.00 cc.
Liquid petrolatum	1.50 cc.
Saccharin—soluble	0.05 Gm.
Water	2.50 cc.

Make a paste and dispense in a tube with large opening at cap end.
A suitable flavor may be obtained by adding 1 cc. of oil of peppermint.

Mix the calcium carbonate and soap together by sieving through a No. 60-mesh sieve. Dissolve saccharin in water and add to the mixture of glycerin, the volatile oil, if used, and the liquid petrolatum. This makes a smooth, creamy white paste which may be colored pink if desired by using 0.154 Gm. of Cherry Red No. 2.

This is not a soap paste; the soap is used as a binder and will not cause a lather.

The oil of peppermint may be replaced by any other volatile oil or combination of volatile oils used as a flavor. The taste may be increased or decreased as desired by adding to or limiting the amount of flavor.

Medicated pastes should be dispensed only on the prescription of the dentist.

80 Gm.—large tube of this paste costs approximately 5 cents.

50 Gm.—medium tube, costs about 3 cents for ingredients used minus tube. The tube may increase the cost from 3–6 cents according to the kind of tube used.

SOAP TOOTH-PASTE BASE.

Precipitated calcium carbonate	50.00 Gm.
Saponis Mollis U. S. P. IX	12.59 Gm.
Glycerin	18.88 cc.

Make into a paste.

Add the glycerin gradually to the soft soap in a mortar and triturate until soap is dissolved. Then add the resulting liquid in small amounts to the carbonate, triturating well after each addition until a smooth, creamy paste results. The glycerin and soft soap will first cause considerable foam which will cease and a clear liquid remain. It may be used while foaming, if desired.

An easy and very satisfactory method to make this paste is as follows:

Precipitated calcium carbonate—desired amount.
Excipient—sufficient to make paste of proper consistency.

The excipient is made by dissolving 10 parts of soft soap U. S. P. IX in 15 parts of glycerin. The excipient gives a suitable color to the paste.

Flavor: The following formula per 100 Gm. of paste gives a pleasing taste:

Benzoic acid	0.25 Gm.
Thymol	0.25 Gm.
Saccharin, soluble	0.25 Gm.
Oil of eucalyptus	1.50 cc.
Oil of peppermint	1.50 cc.

If the paste is to be flavored, the above ingredients, after first being mixed, are added to the excipient. Dissolve the thymol and benzoic acid in the volatile oils and the saccharin in the water used in the excipient. Deduct the quantity of flavor used from the general excipient so that the paste will not become too soft.

This paste produces a rich, soapy foam when brushed on the teeth and leaves a cool, clean sensation in the mouth if above flavor is used. The flavor may be changed, if desired, by using other volatile oils. It will have a yellow tint due to the soft soap.

80 Gm.—large tube of this paste costs approximately 6½ cents.
50 Gm.—medium tube, costs approximately 4 cents; both prices are for ingredients only.

CARBONATE TOOTH-PASTE.

(With flavor.)

Magnesium carbonate	5.00 Gm.
Calcium carbonate, precipitated	65.00 Gm.
Powdered castile soap	5.00 Gm.
Powdered tragacanth	1.50 Gm.
Saccharin, soluble	0.075 Gm.
Glycerin	38.00 cc.
Water	2.00 cc.
Liquid petrolatum	2.00 cc.
Oil of spearmint	0.50 cc.
Oil of peppermint	1.00 cc.

Make a paste and dispense in a tube with wide opening at cap.

Pass the soap, tragacanth, magnesium and calcium carbonate through a No. 60-mesh sieve. Dissolve the saccharin in the water and add to the glycerin and liquid petrolatum. Mix volatile oils and add to glycerin. Incorporate the liquids into the powder until a smooth, creamy paste results.

If a combination of volatile oils is to be used as a flavor it is best to mix them and let stand for a few days. The blending of the oils adds much to the flavor. It may be colored green with 0.154 Gm. of mint green No. 31 if desired.

80 Gm.—large tube of this paste costs about 5 cents.
50 Gm.—medium tube, costs about 3 cents for ingredients only. The tube is extra.

ALKALINE TOOTH POWDER.

Sodium bicarbonate	150.00 Gm.
Carmine No. 40, powder	0.01 Gm.
Methyl salicylate	1.00 cc.
Oil of clove	1.00 cc.

Make into tooth powder and dispense in glass bottles

Add the carmine to a small amount of sodium bicarbonate in a mortar and triturate until color is thoroughly distributed, then add it to the balance of the bicarbonate of soda and mix until uniform color results. Finally incorporate the volatile oils and place in bottle. This makes a harmless, pleasant tooth powder.

OXIDIZING POWDER FOR MOUTH WASH.

Sodium perborate	100.00 Gm.
Carmine No. 40	0.03 Gm.
Oil of cinnamon	2.00 cc.

Dispense in glass bottle.

Mix and make a powder.

Add the carmine to a small amount of the powder in a mortar and triturate until the color is distributed. Add this to the remainder of the powder and triturate until a uniform color results. Lastly add the Oil of Cinnamon.

Plain sodium perborate is more or less disagreeable to taste but with the addition of Oil of Cinnamon the taste is largely disguised. The color is also pleasing.

Dissolve one drachm in a glass of warm water and rinse mouth. It may be used as a tooth-powder if desired, on moistened tooth-brush.

MOUTH RINSE NO. 1.

Saccharin, soluble	0.10 Gm.
Fuchsin, basic	0.02 Gm.
Oil of cinnamon	0.25 cc.
Oil of peppermint	0.25 cc.
Oil of clove	0.50 cc.
Alcohol	300.00 cc.
Talc	10.00 Gm.
Distilled water *q. s.*	1000.00 cc.

Make mouth wash.

Dissolve the saccharin in 10 cc. of water and the fuchsin and volatile oils in 250 cc. of alcohol. Add slowly to the 700 cc. of water and filter through talc. Finally add the remaining 50 cc. of alcohol to make 1000 cc. of finished product.

This is a non-medicated mouth rinse, colored and flavored. It may be diluted with 2–3 parts of water and used to rinse mouth, leaving a pleasant after-taste.

MOUTH RINSE NO. 2.

Thymol	0.50 Gm.
Menthol	1.00 Gm.
Oil of peppermint	3.00 cc.
Alcohol	300.00 cc.
Talc	10.00 Gm.
Distilled water *q. s.*	1000.00 cc.

Make mouth wash.

Dissolve thymol, menthol and volatile oils in 250-cc. alcohol. Add slowly to 850 cc. of water and filter through talc. Finally add remaining 50 cc. of alcohol to make the finished product measure 1000 cc. Product may be colored with Tincture of Cudbear if desired. It may be diluted with 2–3 parts of water and leaves a pleasant taste in the mouth.

MOUTH RINSE NO. 3.

Menthol	0.50 Gm.
Thymol	0.50 Gm.
Eucalyptol	2.50 cc.
Methyl salicylate	0.60 cc.
Alcohol	150.00 cc.
Talc	10.00 Gm.
Distilled water *q. s.*	1000.00 cc.

Make mouth wash.

Dissolve the menthol, thymol and volatile oils in 125 cc. alcohol and add slowly to 850 cc. water, then filter through talc. Finally add 25 cc. of alcohol to filtrate to make the finished product measure 1000 cc. It may be colored green with green mint color No. 31 or red with Tincture of Cudbear.

Formulas for other mouth washes may be found in the U. S. P., National Formulary and Recipe Book.

These three mouth rinses may be used as basis for the incorporation of medicaments if a medicated rinse is desired by the dentist. Many dentists, however, prefer to use nothing but a simple colored and flavored mouth wash having no other purpose in mind than to give a different taste in the mouth. They do not expect an antiseptic or germicidal action from these types of mouth washes and it may be said that claims made concerning the germicidal power of so-called "antiseptic" mouth washes are usually misleading.

It is necessary that pharmacists be well informed about the medicaments dentists use in their practice. Valuable information of this kind may be obtained in a good medical or pharmaceutical library. Many of the more recent remedies used successfully by some dentists may be obtained from the *Journal of the American Dental Association*. In this journal will be found a monthly report issued by the Council on Dental Therapeutics, concerning the analysis of preparations upon which they have or have not given their stamp of approval. When an article is rejected you will find printed there the reason or reasons why it is not acceptable to the Council.

To those who do not know where to find a library containing dental publications and the *Journal of the American Dental Association*, make a visit to the College of Pharmacy in your state and consult their library. The city public library or the libraries of State Pharmaceutical and Medical Associations will contain interesting literature on this subject.

A DIRECT METHOD FOR STUDYING THE EFFICIENCY OF "ENTERIC" TABLETS.*

BY E. LOZINSKI AND G. R. DIVER.

There is often uncertainty as to the fate of enteric tablets after ingestion. This uncertainty is of some concern to those who desire to secure passage of the tablet, unchanged, through the stomach and assurance that after the tablet has passed into the intestinal tract, solution of the coating with liberation and absorption of the medicament takes place.

"In Vitro" experiments where the tablets remain intact in an artificial gastric juice and dissolve in a weakly alkaline solution, while serving as a useful guide, give no absolute assurance that the results are duplicated in the gastro-intestinal tract. The method to be described gives absolute information concerning the fate of enteric tablets and when correlated with "In Vitro" experiments may serve as a guide as to type and method of coating which is most suitable.

The method, although not strictly a laboratory procedure, may be carried out wherever a fluoroscope is available.

The procedure is as follows: One batch of tablets, each containing 0.3 Gm. of barium sulphate and another batch, each containing 0.3 Gm. of sodium salicylate, are coated, using exactly the same technique in each case. A subject, whose urine has been tested and shown to be free from substances giving a purple color with ferric chloride T.S., swallows one of each of the tablets. He is placed under a fluoroscope and the barium sulphate tablet is readily visualized. In from one to two hours, when it is judged that the barium tablet has left the stomach, a barium meal is given. The stomach is now visualized and the barium tablet may now conclusively be shown to have left the stomach and to be lying in the intestines. If the tablet is intact the evidence is conclusive that the coating has been efficient in protecting the medicament in its passage through the stomach. The urine is meanwhile tested every thirty minutes for the presence of salicylates. The test should be negative for at least half an hour after the barium tablet has

* Section on Practical Pharmacy and Dispensing, A. PH. A., Toronto meeting.

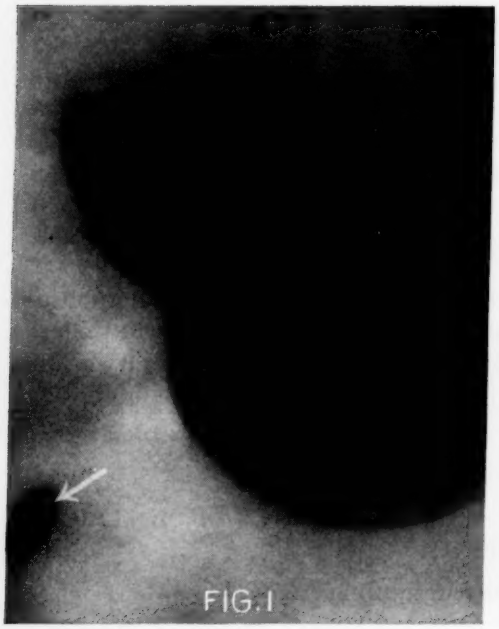
FIG. 1

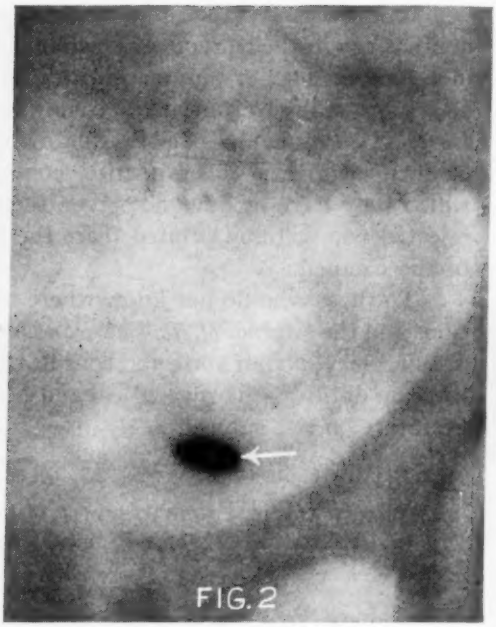
FIG. 2

been shown to be outside the stomach and certainly positive after four or five hours, indicating that solution has occurred in the intestine and that the sodium salicylate is being absorbed. The following are illustrative of the results obtained:

Tablets of barium sulphate and sodium salicylate were prepared as described above. One of each of the tablets was swallowed and the subject studied under the fluoroscope. When it was judged that the tablet had left the stomach, about one to one and a half hours, a barium meal was given and the stomach visualized. The barium tablet was seen to be lying in the intestine and intact (Plate I). One hour later the tablet was still to be seen lying in the intestine and still intact (Plate II). The urine was meanwhile repeatedly tested for salicylates and found to be negative even after forty-eight hours, indicating that the tablet had escaped solution and had presumably passed out in the stool. This experiment therefore provided evidence that these enteric tablets were unsuitable, since they not only escaped solution in the stomach but also in the intestine.

FIG. 3

A second similarly conducted experiment was carried out with tablets differently coated. In Plate III,

taken one and a half hours after the tablet had been swallowed, the barium tablet is seen in the intestine and showing evidence of disintegration. The urine, five hours after the tablets were swallowed, gave a very strong reaction for salicylates. This experiment indicated that these were suitable enteric tablets, since passage intact through the stomach was demonstrated and solution of the tablet in the intestinal tract proved.

SUMMARY.

A method is described for following the fate of enteric tablets after ingestion which gives positive evidence:

1. As to the passage of the tablet through the stomach.
2. As to solution of the tablet in the intestinal tract.

FROM THE LABORATORIES OF CHARLES E. FROSST & CO.,
MONTREAL, CANADA.

MERCHANDIZING THE PRESCRIPTION DEPARTMENT.*

BY GEORGE A. BENDER.[1]

Replying to a question about his aversion to prescription writing, a dispensing physician recently said: "I can't remember all they have down at the drug store. Here, I can look up on the shelf and see what I have."

Lame as this excuse may have been, there is even less excuse for the pharmacist, whose drug store was under discussion, permitting such a condition to exist. He complained bitterly that the physician persisted in dispensing. They played golf together, but they competed instead of collaborating in business. This was but one of the indications that this pharmacist did not properly merchandize his prescription department.

It is realized that the word "merchandizing," as it is used in this article, may have the same effect upon some pharmacists that a red flag has upon a gentleman cow. Although the earth may be pawed when "merchandizing" is discussed in connection with the prescription department, these same pharmacists like the word when applied to other departments of their stores.

In order that there may be a clear understanding of its usage, let us analyze the word, "merchandizing." What does it mean? Apply it to any commodity. It does not mean price, system, selling. In fact, it is that something in between buying and selling. Selling is only the act of wrapping up a package and making the change. But the process of making the commodity known, creating an interest, swelling that interest to desire and demand through display, advertising by word of mouth or other ways constitutes the function of merchandizing. Merchandizing, then, is the act of making the consumer conscious of what you have, aware that he wants what you have, and wants it badly enough to come to you and spend money to satisfy his desires or needs.

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* Section on Commercial Interests, A. PH. A., Toronto meeting, 1932.

[1] Editor, the *Northwestern Druggist*.

Why, then, is it not possible to apply merchandizing principles to the prescription department—and to apply them ethically? If you will analyze the business of any successful prescription department, you will find that it is being merchandized, although its owner may not realize the fact.

Merchandizing, as applied to the prescription department, obligates one only to inform patrons, both professional and lay, of what one has to offer, and to convince them that it is to their advantage to make use of one's services. And, after all, that is the function of the pharmacist, for, as our good friend, Herman L. Emmerich, former president of the Wisconsin Pharmaceutical Association, says, "The successful pharmacist must be, first, a pharmacist, and second, a good business man."

The first requisite of merchandizing is, of course, "having the goods." In the prescription department, this includes more than an adequate stock of reliable drugs and mechanical aids for dispensing. He must possess other tools, among them, native ability, ingenuity, diplomacy.

Education he must have had, to fit himself for the examinations he passed to become registered. But has he kept the process going? Or does his pharmaceutical knowledge consist of that at graduation, less that sloughed off by time? Even so, if he knows where to get the information he wants when he wants it, he is well off.

Among other tools are his books, the U. S. P., the N. F., the A. PH. A. Recipe Book, New and Non-Official Remedies, business and professional journals and current literature. If he will familiarize himself with these and realize the hidden opportunities within their pages, he will find them valuable assets.

What shall he do with these tools?

First, try merchandizing the prescription department to the physicians. Avoid the mistake that so many make of approaching the physician with the "What can you give me?" attitude, requesting, wheedling or attempting to buy his good-will. Go to him and say: "Here, Doctor, is what I can do for you."

The physician in the smaller cities labors under a handicap. He has no laboratory facilities, unless he can attend to them himself or has time to send his material out. With little effort and a minimum of equipment the pharmacist could relieve the physician of many of these tests, at a profit to the pharmacist. These things include such things as urinalysis and blood chemistry, not to mention bacterial examinations.

According to a recent statement by Dean E. R. Serles, Division of Pharmacy, South Dakota State College, all the necessary equipment for carrying out this angle of the drug store's service may be installed at a cost approximating one-third the price of a good modern soda fountain.

If there is in his city a young physician recently out of training, the pharmacist can be of great help to him by offering casual, tactful suggestions and leads. These need not be put in a way that will offend the young professional man's intelligence, but in a helpful way, as one practitioner to another. The young medico can learn a lot about prescription writing, proper combinations and the like from the pharmacist if the latter will avoid making him feel embarrassed. Friendship thus established will be shattered only by acts of the pharmacist himself.

The pharmacist may feature special preparations, detailing his physicians

with them. One young pharmacist who recently purchased an old store, found in the stock enormous quantities of crude drugs. As the sales possibility of these was almost nil, he sought an outlet for the usable portions. Among them was a quantity of wild cherry bark. This he converted into syrup of wild cherry, then added other ingredients to make a special cough mixture. He called on his physicians, gave them samples and told them what he was doing. He found them responsive, and in a short time the preparation was going out regularly.

Fresh infusion of digitalis, Basham's mixture, fresh Blaud pills, sterile solutions, enteric coated capsules and pills, and even ampuls of special nature are within the scope of the pharmacist who is interested in increasing the usefulness of his prescription department. And why shouldn't he be interested in these? Is he not as well trained, basically, as the pharmacist in the large manufacturing house? If he will but do so, he can produce preparations as valuable, authentic and elegant as any one. If he himself is not capable of this, he may readily employ an intelligent recent graduate of a modern college of pharmacy, who has benefited by training not offered to some of the older pharmacists when they were "in the mill." This has been done advantageously by far-sighted pharmacists in many cases.

The position of the reputable pharmaceutical manufacturer should not be under-estimated, any more than it should be over-estimated. These firms have been responsible for great advances in the field of medicine and pharmacy. Because they have unlimited resources at hand to study many of the complex problems of the day, they have developed many invaluable additions to our materia medica. Both physician and pharmacist should recognize this. It does not follow, however, that individual effort should be curtailed, nor that the pharmacist should calmly stand aside and watch a myriad of lesser lights in the drug manufacturing field ruin his business and create dispensing physicians by educating them to hand out catchily named preparations that may be but colored copies of existing preparations compounded out of the cheapest materials available.

On the other hand, it is not beneath the dignity of the alert pharmacist to post himself thoroughly upon the new releases of reputable pharmaceutical houses and to personally convey information about them to physicians. He will thus establish himself in the physician's mind as a wide-awake individual, and he will increase the likelihood that his store will be chosen as a source of supply when there is need for the preparations mentioned.

This personal detailing, it is believed, can become a most important asset to the practicing pharmacist. It gives him an opportunity to tactfully shape his prescription business along the lines he wishes. His own services may be featured; the preparations he prefers to sell may be high-lighted, and those that are not so favored may be delegated to oblivion. He must take care, however, to keep in mind at all times the welfare of the patient. He must not depreciate valuable preparations, and he must not urge upon the physician preparations that are unworthy. Eventually such narrow practices are bound to come out and the reaction which follows will offset any temporary profit.

The value of a good campaign of mailing pieces to physicians cannot be overestimated. Regular contact by mail, be it personal letters or prepared circulars, tends to create favorable remembrance of your store.

A campaign of this kind must bear the earmarks both of sincerity and originality, however, if it is to be effective. If a physician's business is worth while at all, it is worth the added expense of individually typed letters over multigraphing; clean-cut printing over cheap presswork.

When a new, meritorious product comes out, read upon it in medical and pharmaceutical literature, and drop a personalized letter to physicians, detailing its valuable points. This is much more effective than merely sending a standard printed circular, and it impresses the physician with the fact that you are keeping up-to-date.

Besides contacting physicians, the pharmacist should contact the public of his community. This contact should not be confined to his store. He should make use of every opportunity to publicize pharmacy as such before his clubs, schools and the like. Furthermore, a good understanding between him and his newspaper editor will go a long way toward getting professional pharmacy before the public and in averting publication of adverse articles, of which there seems to be no shortage these days.

Some Northwest state pharmaceutical associations are forming publicity committees and speaker's bureaus, to further work of this kind.

The individual pharmacist in his own little community, however, should not overlook his opportunities to carry on this work. He must learn to discern between true and false modesty; not to hide plain fear to stand on his feet before an audience behind the excuse that he shuns publicity. No honest criticism will be directed at him if he attempts to do an ethical job of acquainting the public with pharmacy. He will be at a disadvantage only if he fails to use reasonable judgment in the selection of his subject and its discussion. Creation of confidence in pharmacy generally is much more valuable to an individual in the long run than any play for personal favor.

Having confidence in pharmacy generally, the public favors an individual store principally because of its reputation for good professional service. Its continued patronage is dependent upon the actual satisfaction and service which is received.

These are but a few of the tools that the pharmacist may use in merchandizing his prescription department. The simile is not out of place—like tools of steel, they may be kept sharp and bright, ready for constant use; or they may become dull and corroded, useless to any one.

Regardless of the fact that a prescription may be written the same no matter by whom it is filled, the art of the pharmacist is individual. There are little differences, indefinable, yet impressive. And he who will polish his tools and merchandize them to best advantage will soon find himself with all the work he can do.

Dr. Theodore Holm, Danish-American botanist and explorer, bequeathed his collections and library to the Belgium government for the University of Louvain. Dr. Holm's specialty was arctic and Alpine flora, regarding which he was an outstanding authority. During the last ten years he lived near Clinton, Md., and died December 26, 1932, aged 78 years. Dr. Holm came to the U. S. in 1886 and for eight years was on the staff of the Smithsonian Institution and in later years until 1920, he was in the U. S. Department of Agriculture.

CONTROLLED APPRENTICESHIP AND PHARMACEUTICAL LEGISLATION.

BY HARRY E. BISCHOFF.

I have attended many meetings of the National Association of Boards of Pharmacy and joint sessions with the faculties of colleges and for years proper supervision of apprenticeship has been discussed. To my knowledge much has been said about this phase of education but little has been done about it. If a candidate for examination supplies evidence that he or she has spent four years in a drug store they are credited for the same, irrespective of the nature or type of experience. We all know what is meant by experience and the time has come when we must face the proposition and adopt standards for it. At present a candidate spending four years in a chain store at the rubber goods counter, the soda fountain or the cigar stand is given equal credit to that of the candidate who spends four years as an apprentice under the personal direction of a registered pharmacist.

With very few exceptions State pharmaceutical associations and local organizations continually labor on increasing the requisites for those anticipating the study of pharmacy and give but little attention to the improving of the standards of their membership. It is my opinion that the time has long since arrived when some thought should be given to the standardizing of pharmacies and apothecary shops. I contend that if each State association adopts a minimum standard for such places of business and issues a certificate annually, such as Class "A," Class "B," etc., we will be taking a step in the proper direction. We will be regulating our profession ourselves instead of going to the Legislature at each session and requesting them to undertake a task, which the other professions do not hesitate to perform.

As a basis for the standardization of stores I offer the following:

CLASS "A."

1. Store must be owned and operated by a registered pharmacist complying with the rules and regulations of the Board of Pharmacy.
2. Must be kept clean and in an orderly condition and complying with the health code of the State and municipality in which situated.
3. Must comply with the "Food and Drugs Act."
4. Must comply with the "Federal Narcotic Act."
5. Must comply with the "Non-beverage Liquor Act."
6. Must comply with the "Crimes Act."
7. Must possess latest editions of the U. S. P. and N. F.
8. Must compound or dispense an average of not less than 100 prescriptions each month.
9. Must possess a balance sensitive to at least 1/2 grain.
10. Must possess proper weights and measures; metric weights from at least 0.03 to 30.0 Gm.; apothecaries weights from at least 1/2 grain to 1 ounce; metric graduates from at least 0.2 cubic centimeters to 1 liter; apothecaries graduates measuring from 5 minims to 32 ounces.

CLASS "B."

1. A store that is owned by other than a registered pharmacist, but employing at least two registered pharmacists at all times and complying with the rules and regulations of the Board of Pharmacy.

2. Must be kept clean and in an orderly condition and complying with the health code of the State and municipality in which situated.
3. Must comply with the "Food and Drugs Act."
4. Must comply with the "Federal Narcotic Act."
5. Must comply with the "Non-beverage Liquor Act."
6. Must comply with the "Crimes Act."
7. Must possess latest editions of the U. S. P. and N. F.
8. Must compound or dispense an average of not less than 50 prescriptions each month.
9. Must possess a balance sensitive to at least 1/2 grain.
10. Must possess proper weights and measures; metric weights from at least 0.03 to 30.0 Gm.; apothecaries weights from at least 1/2 grain to 1 ounce; metric graduates from at least 0.2 cubic centimeters to 1 liter; apothecaries graduates measuring from 5 minims to 32 ounces.

If the stores were once standardized, apprenticeship could be controlled in a similar manner to that of the medical student who serves his interneship in a hospital, and we all know that hospitals are rated by the American College of Surgeons. It is my idea that a candidate who is employed the proper number of hours in a Class "A" pharmacy should be credited with full time, while one who spends an equal number of hours in a Class "B" should only be credited for a proportionate number of hours.

A committee on standardization could be elected or appointed to make a survey of all stores requesting such standardization. This committee should consist of at least five members from different sections of the State, which latter should be divided into districts, and any two or more members from a different district than that in which the store is located should be the Committee on Inspection. This service could be rendered to members of the Association without cost, and any one not a member, but requesting such a survey, should be charged a fee at least equal to that of a year's dues for membership. Again I emphasize the fact that we pay too much attention to raising standards of those eligible for Board examinations and entirely forget our professional standing after registration.

The plan outlined above necessitates legislative action and on this subject considerable can be said. We all know of the difficulties encountered in securing favorable action by legislative bodies and undoubtedly some of the obstacles are due in part to ignorance of proper procedure.

It has been my privilege to complete my first year as a member of the majority party of the House of Assembly for the past legislative session in New Jersey and the outstanding feature, relative to pharmacy, has been a lack of ability to properly speak on general subjects on the part of the legislative committees of State associations. I am now thoroughly convinced that cultural subjects should be included in the pharmacy courses. I am also struck by the disregard for other professions' needs displayed by these committees.

All contemplated legislation for our profession should be introduced by a pharmacist (if there be one in the Legislature) or by a member of an allied profession. An erroneous idea has long prevailed that legislation to be successful should be introduced by a member of the majority party. This is only true to a slight degree and to the extent that such a member can get quicker action. *Primarily*, legislation, to be successful, must have merit and be in favor of the public. *Secondly*, we must not encroach upon or usurp the rights and privileges of other pro-

fessions or businesses, always bearing in mind that others are equally and as vitally interested in their profession or business as we are in ours. I have found that legislators are ever ready to aid any business or profession if the measure introduced is fair and non-political. For that reason the introducer of a bill should be thoroughly conversant with its intent. A committee entrusted with a measure by a State association must sell the idea of the bill to its introducer and then to the chairman of the legislative committee to which it is referred. When the bill is reported out, members of the pharmaceutical associations in the various districts of the State must make contact with their representatives, preferably by personal interview. When the bill has passed one House, the legislative committee of the State Association should work on the chairman of the Committee to which it has been referred in the other House, and again, when reported out, make contact with the members of the other House, through the membership of the Association.

If it is found that there be any objection to any section of a bill, this should be preferably straightened out with the objector and if this is not possible without amending the bill an agreement should be sought whereby the Committee will report out a substitute. A committee substitute is always looked upon with greater favor than an amended bill. Naturally the committee that reports the bill out is of the majority party, and a committee substitute is considered the child of the committee and not of an individual.

I am in hopes that the standardization of pharmacies will receive immediate attention and that the faculties of the colleges will be the leaders in this work. A start in this direction would do much toward elevating our profession in the eyes of the public. It would show that retail pharmacy is ready to assume the responsibilities which full professional status entails.

CONFERENCE OF DENTISTS AND PHARMACISTS IN AUSTRALIA.

A preliminary conference between representatives of the Victorian Branch of the Australian Dental Association and the Pharmaceutical Society and Pharmaceutical Service Guild of Australia took place at the College of Pharmacy, Melbourne, on November 2nd.

Dr. F. A. Keil, president of the Victorian Branch of the Australian Dental Association, and Dr. F. A. Aird, secretary; and Messrs. A. W. McGibbony, E. C. McClelland, E. Scott and C. L. Butchers were present, representing their respective organizations.

Among the items discussed were the possibility of National Health Insurance and hospital contributory schemes affecting the practice of dentistry, the necessity for joint action to endeavor to deal with quackery, cooperation with respect to the wider distribution of educational propaganda, the issue of prescriptions for dangerous drugs by dentists, and the prescribing of gargles and mouth washes in place of oral directions to the patient to obtain some proprietary article.

After a general discussion on the above lines it was agreed that at a later date the executive of the Dental Association might meet the pharmacists again. Dr. Keil said he felt there was room for greater coöperation between the two bodies, and that he would recommend his association to approve of joint meetings being held occasionally on the lines suggested.—*Australian Journal of Pharmacy.*

Mr. James Herbert Dinwoodie, a pioneer Johannesburg chemist (pharmacist), died at his residence, "Wamphray," Westwold Way, Parkwood, Johannesburg, on October 1st, aged 65. Born at Lochmaben, Dumfriesshire, in 1867, Mr. Dinwoodie went out to South Africa in 1893, and established the business known as Dinwoodie's Drug Stores at the corner of Bree and King George Streets, Johannesburg, in 1896. After service in the Boer War, Mr. Dinwoodie became first president of the Transvaal Pharmacy Board in 1905, and an examiner for many years on that Board.

THE DEPARTMENT OF THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

C. B. JORDAN—CHAIRMAN OF EXECUTIVE COMMITTEE, A. A. C. P., EDITOR OF THIS DEPARTMENT.

Editorial Note: The following paper, "Has Freshman English Any Permanent Value?" by Alice-Esther Garvin of the Connecticut College of Pharmacy, should be read with thought and care by every teacher in colleges of pharmacy. Miss Garvin has set forth, most emphatically, the need for more and better training in English in colleges of pharmacy if the pharmacist is to take his place as an educated man in his community. I am very sure that no one can take any exceptions to her well-rounded argument on this point. If only one year of English is to be given in the college of pharmacy, there will be differences of opinion as to whether this should be given in the freshman or senior years. English is a tool that the student *must* use throughout his college course and therefore our better colleges, liberal arts, scientific, professional and technical, place it in the first year. Miss Garvin presents splendid arguments for placing it in the senior year. Whether her arguments offset the traditional one presented above is the question that the reader must settle for himself.—C. B. JORDAN, *Editor.*

HAS FRESHMAN ENGLISH ANY PERMANENT VALUE?

BY ALICE-ESTHER GARVIN.*

We learn from experience that we learn nothing from experience. Some time ago, with a more or less sanguine hope that pharmacists with college training might be looked upon as the social, intellectual, and professional equals of physicians, surgeons, attorneys, *et al.*, cultural subjects were included in the pharmacy college curriculum. Among these scientifically extraneous subjects was the language supposedly current in the United States: *i. e.*, English. Of course the question naturally arose as to the year in which this study might most logically be placed, and, alas for its permanent value, it was thrust into the first year with the introductory courses in other subjects.

Few people engaged in the heart-rending task of "raising the standard of pharmacy" can deny that English is one of the most important studies taught at any college. Surely a man is judged by his ability to express himself well, to write accurately and forcefully, and to discuss, with his colleagues, affairs of national and international importance. From the point of view of the customer, the pharmacist who speaks well inspires more confidence than the one who seems to have no sense of grammar, who habitually mispronounces or incorrectly uses his words, or whose entire vocabulary seems to be "What else?" or "Will that be all?" We are rapidly approaching the point where people do not expect the druggist to know anything except the compounding of prescriptions, the methods of selling cosmetics, and the relative values of certain patent medicines. If a pharmacist *does* happen to read something besides *True Detective Mysteries, War Stories, True Confessions,* or *Ballyhoo,* he is looked upon as being so far superior to his fellow-druggists that an explanation is demanded. Contrary to the general belief, intelligent customers like to chat with a pharmacist, particularly if he is the proprietor of a neighborhood store. If he wishes to retain their patronage and goodwill, he must be able to discuss, in fairly well-chosen words, the topics in which

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they are interested. If, however, his horizon is limited to capsules, suppositories, and Mack Sennett comedies, the good customer will often seek another druggist.

To the young men and women who read our catalogs with such naïve faith in the importance of pharmacy as a profession, we owe something. At present, the great aim of pharmacists with vision is to raise the standard of our profession, and we are battling against terrific odds, both within and without the pharmaceutical pale. An important victory has been gained in the adoption of the four-year course; we should commend the laudable work being done by the local, state, and national organizations which have offered resolutions affecting the advancement of the American druggist. We should not, however, lose sight of the fact that in order to raise the standard of pharmacy, we must raise the standard of the pharmacist. Of course we are working ceaselessly; we write to governors, congressmen, senators, the President himself; we seek recognition in the army and navy; we spend weeks, months, and years in surveys and research work. All of this is necessary, and we ought not to eliminate any of it from our plans. But are we also making the pharmacist better able to go on in the enjoyment of life, liberty, and the pursuit of happiness? Are we broadening the range of his perception? Are we giving him a depth of understanding, of vision, of human sympathy? Are we increasing his appreciation of beauty, of the seven arts, of life itself? Are we thinking of him as an individual, devoting his life to service, and deserving the best that life has to offer, with a trained appreciation of this "best"; or are we thinking of him as a cog in the machine known in general as Pharmacy, but specifically as one more student paying tuition?

Certainly I do not mean that more English in a college of pharmacy would be like a war to end all wars. Nor do I mean that additional courses in English will solve all problems, and simultaneously place the druggists of America on the same mental, social, and professional plane as the surgeons, lawyers, and bankers. My contention is that the greater a pharmacist's knowledge of English in its various phases, the greater correspondingly will be his efficiency in the method of conducting his business, his poise in greeting customers, and his true estimate of himself. By "various phases of English" I mean the writing of a fine sales letter, of a salient editorial, of a feature article for a trade journal, a letter of appreciation for a favor, of congratulation to an important customer; the ability to address, with warranted assurance, the members of a club or society, a state association meeting, a political rally, or a group of several thousand high school students, and by "ability," I mean skill in using well-chosen, powerful, correctly pronounced words—the ability to impress, favorably, an audience, and gain their respect and confidence. I believe, too, that every druggist should be able to take his place among other professional men in their discussions of topics of world interest; that he should have a general, if not specific, knowledge of the great novels, dramas, essays, and poems of this and former generations. A knowledge of the Russian dramatists, or the English poets, or the German essayists, or the French novelists will assist a pharmacist in his understanding of foreign nations, will enable him to discuss these features with any customer who is interested, will permit him to occupy a position of respect and admiration in his community, and may, as a matter of fact, wean him from the sports pages or the humorous sections of the newspapers.

One of the most serious errors made by pharmaceutical educators was the

placing of English in the freshman year, particularly if there is (as in the Connecticut College of Pharmacy) just one year of English in the four-year course. Why is pharmaceutical jurisprudence placed in the fourth year? Because the students will need to know the law when they open their own pharmacies, and might forget the subject in the three-year interim. Why is merchandising placed in the fourth year? Because students will need this upon graduating, albeit the vast majority of them are working in drug stores during the college course, and need, no doubt, some theoretical training. Consider all the subjects placed in the fourth year, and you will discover that they have a direct bearing upon the student's life after he leaves the college. But English, which a pharmacist is going to need *more* than he needs anything else he studies, is put in the first year, on a plane with the introductory, the elementary subjects, and then hurled into the limbo of forgotten things when the onrush of quantitative analysis, accounting, and business management, biochemistry, and pharmacology sweeps them into the scientific field. For three years in college, and for many more years outside of college, he will have no definite contact with courses in English, and unless the faculty members are unusual in their knowledge of grammar-rules, diction, enunciation, *et al.*, the students will not even *hear* correct English in classes, or *read* it in bulletin-board announcements during the other years of his college life.

Let us look at the matter from the student's point of view. The average youth who matriculates at a college of pharmacy—or, for that matter, at any professional school—has had four years of high school English. The educators of America have never changed their minds about English being the one subject that is compulsory for four years in the secondary school. Regardless of the course he intends to pursue in later life, whether the pupil plans to be a surgeon or a teamster, if he graduates from high school, he may have eluded foreign languages, history, mathematics, drawing, singing, physical training, or Greek, but four years' drill in the mother tongue was inescapable. He is young; he has failed, as some administrators fail, to realize the value of this four years of study. To him it has meant a succession of carrying themes carefully, even on rainy days, as the teacher objected to crumpled papers; of memorizing twenty-five lines of "Julius Cæsar," or "Hamlet," or the "Idylls of the King"; of giving oral reports on "How I earned my first dollar"; of correcting grammar; of eliminating from his vocabulary the split infinitive, the picturesque slang phrases, the slurred "ing," the hashed metaphors, the obsolete past participles; of placing commas, periods, apostrophes, semi-colons, and colons in their appointed places. In fact, to the average college of pharmacy freshman, the four years of secondary-school English, despite the beauty, originality, and personal charm of the various teachers who drove him through the subject from year to year, remain, to him, a sort of nightmare, or a thorn painfully removed from the flesh. He enters a college of pharmacy, hoping to be greeted at once with laboratories, prescriptions, compounds, and comcomitant practicalities, and what meets his jaded gaze? ENGLISH, for two, three, or four hours a week! Of course the educator who arranged the freshman English course felt, I am sure, that the first year's study was essential to assist the student in his other three years of work in the college. If he is working in a pharmacy, as many freshmen are, he will be greatly benefited by the course, but this benefit will not be so impressive nor so lasting as if it were given later in his career. If

he needs a course to carry him through lectures and written quizzes in pharmacy math, physiology, botany, organic chemistry, dispensing pharmacy, or physics, then the first-year course should be reorganized completely, and hewed to fit students for their work at the college. Certainly it cannot fit them for their work *beyond* the college.

If, on the other hand, no English be given for the first three years, we may expect some splendid and permanent results from the fourth year's training. For three years the student has had scientific subjects relating more or less directly to pharmacy. He may have had, in his first or second year, a few cultural subjects—a little French or German, some economics—but no English. He may have had three years' practical experience in a drug store, where his own employer's wrestling with English may have brought about his own desire to improve his knowledge of that study. No longer will he consider it an introductory course, an elementary subject; no more will he think of it as being a filler-in to pad out the four-year course. If he is a clever youth, he will apply everything taught in that senior course to his own pharmacy, which, at this period, is probably emerging from the dream-chrysalis of his mind. The correct method of writing a business letter to the secretary of the state board of pharmacy is an important matter to a college senior—to a freshman, it is just one more letter; the courteous, yet business-like note to be sent to the Bureau of Industrial Alcohol to apply for Permit "I" has a definite meaning to a fourth-year man—when would a freshman use that information? A letter of appreciation to a hostess, a note of congratulation to a friend, a letter of regret, a note refusing an invitation, a brief missive of condolence—all of these have come within the experience of a senior, while to a freshman, they represent merely a task. The points to be remembered when making an address; the parliamentary procedure contingent upon being an officer of a class, club, or fraternity—or upon being heard from the floor when a member of one of these; the chief points to be taken into consideration when one is discussing with a friend or acquaintance the merits or defects of a motion picture, drama, magazine article, book, advertisement—all of these assume a more definite importance in the mind of a senior than in the mind of a freshman. The latter thinks this information is to be expanded from year to year, possibly in other courses; the senior realizes that this is his last opportunity to have a college English course, and he will be earnest and sincere in the mastery of it. The senior considers himself a full grown man. His friends may be in liberal arts colleges, and, while as a freshman he was too immature to realize his deficiencies in the matter of speech, mental training, cultural background, and a general knowledge of the things people talk about, by the time he has reached his senior year, he is doing some thinking about himself and his impotence in the matter of speech, as he finds himself unable to cope with his friends' discussions. Possibly he may have been doing some reading—a few good books or magazines—without any guidance, or sense of appreciation. THIS is the student who should be given a course in senior English second to none at any university, in any walk of life. He is three years older. His mind has been given a keen edge by scientific study, identification of drugs, compounding of prescriptions, working out chemical equations. He will soon be in a position to be the manager of a store, or perhaps to have his own name, in gold-leaf, on the door. Now, if he has had, three years ago, a course in freshman English,

will he be able to meet his intelligent customers with confidence? Will he know what they mean if they happen to mention a book, magazine, or play? Can he hastily wrench his mind from the present, and fling it back to the past, and remember what he may have learned during his first year of elementary English at the college? Will he be able to remember what seemed to him unimportant and trivial at the time—the writing of news items, of business letters, of worthwhile articles for pharmaceutical journals?

Only those teachers who have had freshmen and upper-classmen in approximately the same type of college English can appreciate the immaturity of the yearlings, and the interest of the older men. The freshmen are becoming acclimated to college life, and they realize that all their subjects will be supplemented in the years to follow; they hear much about foundation work, and elementary principles, and introduction to pharmacy. How much do they hear about other English courses to follow? The pharmaceutical educators believe that this one year will carry a freshman through life, and enable him to fit into the same social and professional sphere as the physician, the lawyer, the clergyman, and the banker. He *completes* his study of English during the freshman year, and for three years he is relieved, so far as the college is concerned, of the responsibility of knowing how to speak, write, or think correctly in the mother tongue. Even the finest English course cannot survive three years of lack of practice, any more than the finest chemistry course can survive three years of unrelieved cultural subjects.

My plea is that we give our college of pharmacy students an opportunity to have a course in English that will mean something to them throughout their lives. Do not relegate it to the freshman year with the other introductory and elementary subjects: that is an insult to their intelligence and to ours. They are going to need the cultural training afforded by this study, and they will enjoy it after three years of sciences. Hundreds of pharmacists, graduates from our colleges, and speaking beautiful, powerful English; writing courteous, grammatically correct, accurately punctuated letters; and being able to keep pace in any discussion of foreign affairs, modern fiction, magazine editorials, will do more to elevate the standard of pharmacy than any number of our papers, articles, speeches, and theories can ever do. If we enrich a pharmacist's life, give him a sense of appreciation, a knowledge of the world that he may gain through no other medium, and a desire to continue developing mentally, he will soon take his place among the men in the other respected professions.

Only the highest praise should be given to colleges such as Western Reserve, where English is placed in the freshman *and* senior years; or to Purdue, where English is given in the first and third years. For those men of vision who are offering two years of English, one of which is in the senior year, I have profound respect and admiration; I wish all the colleges might follow the trail that they have blazed. This placing of English in the fourth year is not a noble experiment; it is a definite step toward that goal which is the object of so many monographs, magazine articles, addresses, committee meetings, and conventions; that goal which burns with a pure, gem-like flame, but which seems almost unattainable. For better pharmacists, for greater respect for our profession, I offer one solution: give two years of English, or take it out of the elementary class, and place it with those subjects that seem almost as important.

"*The Druggists Circular* through the activities of its Associate Editor, Mr. R. W. Rodman, conducted an interesting experiment to determine how well seniors in colleges of pharmacy are informed on up-to-date matters. In fact, it might be said that the one purpose of the experiment was to determine whether these seniors read the drug journals or not. I take it that every college of pharmacy has plenty of drug journals available for the use of the students and that it is a question of whether these students are assigned reading in these journals or are in some other way required to peruse them. The result of this experiment, as shown in the following paper by Mr. Rodman, is enlightening to say the least. The Editor has no defense to make for colleges of pharmacy in this regard. I wish to point out, however, that the trade journals are only a small part of the journals that a good college of pharmacy makes available for the use of its students, and the teachers of the different subjects in colleges of pharmacy will naturally assign reading in the journals that treat more completely of the subject that the instructor is teaching. It therefore remains primarily for the teachers of pharmacy, and especially the teachers of commercial pharmacy, to cover the field that Mr. Rodman so well indicates is not covered. I believe this experiment would have been more interesting had it not been limited to subjects that were found primarily in trade journals. I would urge Deans of colleges of pharmacy to carefully read Mr. Rodman's paper."—C. B. JORDAN, *Editor.*

CONTEMPORARY PHARMACY AND THE STUDENT.*

BY ROBERT WILLIAM RODMAN, ASSOCIATE EDITOR, THE DRUGGISTS CIRCULAR.

What does the future hold for pharmacy? Will the pharmacist of to-morrow be in a more advantageous position than the pharmacist finds himself in to-day?

For many years these and similar questions have been propounded on the floors of our national conventions and have appeared in the pages of our drug journals. We have heard it said that the future is what we make it and many of us, no doubt, have taken that statement as more or less bromidic without stopping to realize what we actually can do as individuals and collectively to advance the interests of our profession, particularly as they apply to the future.

Pharmacy has suffered from a number of ills in recent years but I can conceive of none perhaps more basic than the lack of interest, enthusiasm and organization of its members. In my opinion, conditions in the profession which we are unable to correct at the present time will never be rectified until the day dawns when a majority of the pharmacists of the country take a greater interest in their solution. Many projects which have been launched in recent years and which would be of inestimable benefit to the pharmacist have suffered primarily because the man whom they were intended to benefit most knew the least about them and consequently was the least interested in them. Membership in our national and state associations is far from what it should be and the financial status of some of the smaller associations at the present time reflect this condition.

Encouraging the interest and enthusiasm of retail druggists and stimulating them to greater activity is certainly a most important fundamental in not only safeguarding the future of the profession, but also in providing for its present welfare. Assuredly it is one necessity which should be studied at the first opportunity.

A few months ago I undertook to survey the knowledge and interest of the senior students of six of our colleges of pharmacy pertaining to national affairs. How much did the new crop of pharmacists entering the profession know of what

* Presented before the Conference of Teachers of Pharmacy of the American Association of Colleges of Pharmacy at its thirty-third annual meeting held in Toronto, Ontario, August 22nd.

was going on in the field about them? I believe the results give us a key to the solution of our problem.

The students were asked ten questions:

1. Who is president of the AMERICAN PHARMACEUTICAL ASSOCIATION?
2. Who is president of the National Association of Retail Druggists?
3. Who is chairman of the United States Pharmacopœia Revision Committee?
4. Who is chairman of the National Formulary Revision Committee?
5. What is the Seligman Report?
6. Who is W. Bruce Philip?
7. What is the Capper-Kelly Bill?
8. What important work has been in progress in St. Louis, Mo., during the past year?
9. What is the Druggists' Research Bureau and what is its function?
10. Who is Wroe Alderson?

Of 394 senior students in five of the colleges surveyed:

0 knew the name of the president of the AMERICAN PHARMACEUTICAL ASSOCIATION,
0 knew the name of the president of the National Association of Retail Druggists,
4 knew the name of the chairman of the National Formulary Revision Committee,
24 knew who Wroe Alderson is,
25 were familiar with the Seligman Report,
40 could identify W. Bruce Philip,
94 knew the name of the chairman of the United States Pharmacopœial Revision Committee,
109 knew something about the functions of the Druggists' Research Bureau,
206 were familiar with the National Drug Store Survey at St. Louis, and
306 could identify the Capper-Kelly Bill.

On the basis of these results the five colleges would be graded at 14 per cent, 19 per cent, 25 per cent, 26 per cent and 29 per cent correct, respectively, and the group as a whole at 28 per cent. All the papers were carefully graded and a student who demonstrated the slightest familiarity with any question was given full credit.

I feel sure that you will agree with me that the results show a need in our college curriculum for some form of instruction along the lines of contemporary pharmacy.

The interests of the profession of pharmacy will undoubtedly be best served by men who are cognizant of national issues and problems affecting the trade. I believe the future of our associations are largely dependent upon this consideration as well.

The comment that there is plenty of time after the student is graduated by a college for him to become active in affairs beyond the limits of his own drug store if he is interested in so doing may possibly be advanced. If that is the judgment of the majority I fear we are losing an exceptional opportunity to encourage and supervise the men which is essential to the work. If students in colleges of pharmacy are required or encouraged to keep abreast of the times, if they participate in discussions of national affairs in the class room under the competent guidance which I am sure their professors are in a position to offer, they will not only develop the ability to intelligently read and understand information pertaining to problems facing the profession but will be stimulated to do so and to take an active part in meeting such problems wisely and to the best interests of pharmacy.

The inclusion of instruction in contemporary pharmacy in the college curriculum is not only possible but has actually materialized in some colleges, I believe.

The questionnaire which I distributed revealed the fact that at least one institution is following such a course.

In submitting these questionnaires I assured the deans of the various colleges that in presenting the results I would not identify the institutions which so generously coöperated in the study. The results from one college, however, were so significant that I asked its Dean to relieve me of that obligation in order that I might pass along to you something of his method of dealing with the subject and he assented.

The students of the School of Pharmacy of the University of Maryland made a record of 77 per cent on the questionnaire and when I asked Dean DuMez for information concerning the course as given at his college he replied as follows:

"We do not attempt to teach contemporary pharmacy in a special course, but each teacher is expected to take up that phase of contemporary pharmacy which applies to the subject he is teaching. By so doing, the professors in pharmaceutical chemistry will naturally bring to the student's attention contemporary workers in the field of pharmaceutical chemistry and the work which they are doing. The same holds true for the professors in pharmaceutical botany and pharmacognosy, professors in pharmacy, professors in commercial pharmacy, and professors in pharmacology and therapeutics. By this system the whole field is fairly well covered and covered from the viewpoint of the different teachers.

"Most of our teachers make definite library assignments so that all of our students are compelled to make use of drug journals frequently throughout their course. Another reason why our students have made such a good showing may be due to the fact that our journals are most accessible to them. Our library is located on the first floor of the pharmacy building and the students use the reading room constantly for study purposes. All of the domestic and the more important foreign pharmaceutical journals are stored openly on shelves in this reading room, and there are practically no restrictions placed upon their use by the students so long as they do not take them out.

"Most of our teachers, I am sure, do make a special effort to impress upon the students the value of pharmaceutical associations and the necessity for knowing what is going on in the drug field if they are going to keep up-to-date and be successful when they begin practicing."

Undoubtedly the results of Dean DuMez' work will be reflected in the future development of graduates of his college and their ability to cope with situations with which they will be faced.

I believe that the results of such instruction as I have in mind would be achieved only if it were based upon a well-rounded-out selection of magazines, including as many different journals as possible in order to receive the editorial opinions and interpretations of as many minds as possible.

May I, in closing, express with propriety, the suggestion that the development of an outline for a course in contemporary pharmacy that could be used as a guide by those who realize the importance of this phase of modern education might be advantageous. If members of the pharmaceutical press can lend any assistance to you in your efforts now or at a later date, I feel sure you will find them ready and eager to serve.

The profession of pharmacy needs the assistance of you gentlemen in developing generations of intelligent, alert and responsive pharmacists of wide vision and ready initiative.

A member of the A. PH. A. desiring a position can insert a brief "Want Ad" in the JOURNAL without cost.

COMMITTEE REPORTS

REPORT ON THE CANADIAN FORMULARY.*

BY R. O. HURST.[1]

It is easy to understand how it would be difficult for the British Pharmacopœia to be compiled so as to at once fulfil the exacting requirements of the central part of the Empire and its far-flung outposts. Canada has problems in pharmacopœial standards that it was generally felt could not be solved satisfactorily by the new British Pharmacopœia. With this situation in mind, the Committee on Pharmaceutical Standards in Canada, who made many contributions to the revision of that Pharmacopœia, continued their efforts in revising the "Canadian Formulary." This Formulary has gone through four editions, the last of which is not only exhausted, but has long since failed to meet the modern needs of both pharmacist and physician.

The new volume, it is expected, will be ready for distribution early in 1933. In character it will be quite unlike that of any of the former editions. It will be composed of three sections, each totally different in character and function. These sections are briefly described as follows:

The Addendum.—This portion of the book is intended as supplementary to the new British Pharmacopœia, inasmuch as it specifies standards for therapeutic material, which is of direct interest to Canadians. In this list will be found some items in the new British Pharmacopœia, but for the most part, items which were omitted from that book and which find a place in our own Materia Medica. The Addendum is also extended enough to cover many galenicals which have had such variations in commerce, so as to bring them within the category of absolute uniformity throughout the Dominion. This section of the book is to be regarded as official, *i. e.*, mandatory and binding on pharmacists and physicians. Under this heading one will find about 50 items, among which are Syrup of Codeine Phosphate, Aromatic Elixir, Elixir of Three Bromides, etc.

The Physicians' Section, the Formulary Section, is designed as a guide for the physician in making combinations of therapeutic substances, and means of covering any distaste by suitable flavorings or media. Much experimenting has been done in laboratories before these suggestions were endorsed by the Committee. They are written in prescription form in small doses, so that multiple doses can be easily computed. The prescriptions follow the full series of the common forms in which drugs are exhibited, namely, lotions, liniments, mixtures, etc., involving about 60 items, among which one will find suitable formulas for Tannic Acid for burns, Ophthalmic Solutions, Iron Mixtures, Antacid Powder, etc.

Reference Section.—This constitutes a compilation of formulas garnered from every source, and their admission to the Formulary was determined by the degree of popularity, as ascertained by questionnaires sent to pharmacists throughout the Dominion. These formulas are included to not only make the Formulary useful to the pharmacists, but to save them searching many volumes of textbooks for such a formula. In many instances several formulas are found for the same preparation, in which case the editors adopted one, or sometimes two, in the hope that their inclusion would conduce uniformity in Canada. This section is not mandatory. In this section will be found such formulas as Lugol's Solution, Mandl's Pigment, Keith's Dressing, etc.

It is hoped that this new volume will have a strong appeal to both physician and pharmacist—to physicians, particularly in the Formulary Section, to pharmacists in the Reference Section and to both in the *Addendum* to the British Pharmacopœia. Its revision has been retarded, because it was deemed advisable to wait for the new British Pharmacopœia, and to have a parallelism in terminations and nomenclature.

The activities of the Revision Committee on Pharmaceutical Standards in Canada, both in the British Pharmacopœia and the Canadian Formulary, were directed by Prof. V. E. Henderson, Department of Pharmacology, University of Toronto. The appointed editors were Prof. G. H. W. Lucas, Department of Pharmacology, University of Toronto and Prof. R. O. Hurst, Ontario College of Pharmacy.

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* Toronto meeting, 1932. Submitted as a preliminary report of progress and design.

[1] One of the Editors.

PROCEEDINGS OF THE LOCAL BRANCHES

"All papers presented to the Association and Branches shall become the property of the Association with the understanding that they are not to be published in any other publication prior to their publication in those of the Association, except with the consent of the Council." —Part of Chapter VI, Article VI of the By-Laws.

ARTICLE III of Chapter VII reads: "The objects and aims of local branches of this Association shall be the same as set forth in ARTICLE I of the Constitution of this body, *and the acts of local branches shall in no way commit or bind this Association, and can only serve as recommendations to it.* And no local branch shall enact any article of Constitution or By-Law to conflict with the Constitution or By-Laws of this Association."

ARTICLE IV of Chapter VII reads: "Each local branch having not less than 50 dues-paid members of the Association, holding not less than six meetings annually with an attendance of not less than 9 members at each meeting, and the proceedings of which shall have been submitted to the JOURNAL for publication, may elect one representative to the House of Delegates."

Reports of the meeting of the Local Branches shall be mailed to the Editor on the day following the meeting, if possible. Minutes should be typewritten with wide spaces between the lines. Care should be taken to give proper names correctly and manuscript should be signed by the reporter.

BALTIMORE.

The Baltimore Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION held its regular meeting at the Emerson Hotel, January 24, 1933. The meeting was called to order by President Thompson. The speaker of the evening was Dr. E. F. Kelly, who had for his subject, "The Final Reports of the Committee on the Cost of Medical Care."

The speaker discussed the make-up of the Committee on the Cost of Medical Care briefly and told how the work had been carried out. He touched on the various clinical medical phases of the report and discussed at great length the pharmacists' part in the recommended new order of medical service. He discussed the recommendations of the Committee concerning the pharmacist's responsibilities to the public and the importance of proper pharmaceutical education.

Since the report of the committee was discussed in great detail in a recent editorial of the JOURNAL A. PH. A., no further comment is necessary here.

Dr. Kelly's excellent paper was actively discussed by Messrs. Aquilla Jackson, C. L. Meyer and Simon Solomon. The discussion was entered into by the members present and it was generally agreed that the reports of the Committee on Medical Care are worthy of study by all retail pharmacists.

The meeting was attended by about 30 members and their friends. Following the discussion the annual election of officers was held. The Nominating Committee, appointed by President Thompson, presented the following names: For *President*, Simon Solomon; for *Vice-President*, W. F. Reindollar; and for *Secretary-Treasurer*, C. Jelleff Carr. Upon vote these members were unanimously elected.

C. JELLEFF CARR, *Secretary-Treasurer.*

DETROIT.

The December meeting of the Detroit Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held December 16, 1932. The meeting was preceded by a dinner, and the members were greeted by Professor Joseph L. Dorian and the students of the College of Pharmacy of the Detroit Institute of Technology who in the spirit of the season erected a beautifully decorated Christmas tree, loaded with gifts for those attending.

The meeting was called to order by President Robert Fleisher, of the Branch. The minutes of the previous meeting were read and approved.

Dean R. T. Lakey was asked to lead in the discussion on pharmacy laws in Michigan. He covered the need of some of the changes, necessary to keep Michigan abreast of the times. He said Michigan is the only state in District 3 that does not require a finished course in pharmacy to take the State Board examination. He pointed out that at present the law simply requires two years of college while the recognized colleges of pharmacy in Michigan require four years for graduation; the pharmacy law has not kept abreast with the advance in pharmaceutical education.

Besides Michigan the district consists of Wisconsin, Indiana, Illinois, Ohio, Pennsylvania and Kentucky.

Removal of the assistant would eliminate another problem in Michigan. The status and rights of the assistant has always been a debatable one.

Dean Lakey suggested the entire Michigan pharmacy law be rewritten.

So many amendments have been made to the law since its adoption in 1886, that many contradictions are to be found. He also suggested that State Board members should be college graduates or at least required to have the same type of training as those to be examined.

The many barriers to bring about better conditions in pharmacy were explained by using the Capper-Kelly Bill for illustration. The N. A. R. D. has been working on this Fair Trade measure for 30 years and only now the Bill is gaining favor and the prospects for the passage of this Bill seem very bright.

A number of the students entered into the discussion, expressing their ideas on the need of pharmacy legislation. Wilbur L. Scoville entered into the discussion and said the type of drug store that can be operated successfully depended entirely on the location.

A rising vote of thanks was given to Dean Lakey for his interesting discussion.

Professor Dorian with the assistance of his students distributed useful gifts to all. He, too, was given a rising vote of thanks for his efforts.

The Branch is indebted to Dr. Geo. Dikeman, of the Mutual Drug Co., and to Frederick Stearns & Co. for helping to supply the many gifts.

BERNARD A. BIALK, *Secretary.*

NEW YORK.

The January meeting of the New York Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held January 9th, at the College of Pharmacy, Columbia University. President Fischelis was in the chair. There were over seventy members present.

The secretary rendered his report which was accepted. Chairman Mayer, of the Audit Committee, reported that he had approved all bills submitted to him. The report of Treasurer Turner F. Currens was read and accepted.

Chairman Lehman, of the Committee on Education and Legislation, reported as follows:

"The action taken by the legislative committee of the N. Y. State Pharmaceutical Association in their meeting of the 9th inst., decided to re-introduce the 'Poisonous, Deleterious and Habit-Forming Drug Bill,' providing that the sale of all medicinal preparations, be they official, proprietary or household be under the supervision of the N. Y. State Board of Pharmacy, and therefore sale is limited to stores registered by this board.

"The second bill to be introduced will be the Fair Trade or Junior Capper-Kelly Bill, same as now in force in California.

"Third bill is the discrimination bill, which forbids price discrimination of certain kinds.

"The Legislative Committee approves in principle the bills providing for a uniform State Narcotic Law, and the Counterfeit Label Bill, the latter having been introduced in the U. S. Senate this session.

"It is reported that senate bill S. 97, Capper-Kelly, is to come up for vote in the Senate this week.

"The appeal on the Pratter Case is still before the Court of Appeals in Albany, and decision is expected in a few days. (The appeal was decided against the N. Y. State Board of Pharmacy on January 10th.)"

Mr. Lehman's report was discussed by Messrs. Dworkin, Schaefer and Seeley. Dr. Fischelis advised members of legislative committees to watch a Federal Bill in which it is proposed to make an undesired classification of an apothecary in addition to that of a pharmacist.

The president next called attention to the publication of the new Pharmaceutical Syllabus for the Four-Year Course in Pharmacy, copies of which can be obtained from Chairman J. G. Beard of North Carolina.

Dr. Fischelis then commented on a letter in the January 7th issue of the *Journal of the American Medical Association*, in which a Chicago physician, because of three recent deaths in a New York hospital and six similar accidents in a Chicago hospital in 1927, advocated that, "all containers of solutions of boric acid in hospitals be distinctly labeled POISON." President Fischelis felt that it would be a better practice for the pharmacists to handle the boric acid solutions rather than to have them labeled POISON.

The secretary reported that he had received a communication from Chairman Cook stating that the December report of the Branch Committee on the Progress of Pharmacy would be included in the Revision Circulars. It was also reported that Bernard Henkin had become a member of the parent organization.

Dr. Schaefer, in a very appropriate speech,

congratulated Dr. Fischelis on his recent election to the vice-presidency of the parent organization.

Chairman Mayer, of the Committee on Nominations, reported as follows: For *President*, Ernst A. Bilhuber; for *Vice-President*, Charles W. Ballard; for *Secretary*, Rudolf O. Hauck; for *Treasurer*, Turner F. Currens.

COMMITTEE CHAIRMEN.

Education and Legislation, Robert S. Lehman; *Audit*, Joseph L. Mayer; *Progress of Pharmacy*, Charles E. Heimerzheim; *Professional Relations*, James H. Kidder; *Membership*, Herbert C. Kassner; *Secretary, Remington Medal Committee, Delegate to House of Delegates*, Hugo H. Schaefer.

In due order the nominees were elected. The president congratulated the Committee on its work, and expressed his regret on the retirement of Dr. Herbert C. Kassner as *Secretary*. The president felt that the zeal with which Dr. Kassner had conducted his office merited the sincere thanks of the Branch, and he asked that a rising vote of thanks be tendered the retiring secretary. Dr. Fischelis concluded his remarks by expressing his thanks to the members for the support they had given him at all times during his term of office.

President Fischelis introduced Charles Wesley Dunn as the speaker of the evening. The subject of his address was "Legislation to Outlaw Unfair Price Competition and Unfair Price Discrimination from Commerce."

An abstract of his address follows:

The speaker, in his capacity as Counsel to many pharmaceutical and grocery manufacturers, has come in contact with, as he states, "One of our most important legal and economic problems—price control."

Mr. Dunn began his address by pointing out that conditions to-day are the worst we have yet experienced as regards price cutting. He feels that we are in a new stage in merchandising in this country and, as a consequence, we face severe price competition indefinitely, due to economic conditions. Fifteen or twenty years ago resale prices were fairly well standardized, but since then manufacturers have measurably lost control over the resale price of their products. On top of this has come the greatest depression in all history. In the mad scramble for business, prices have been cut still lower, so that to-day many items are sold below their actual cost. Since business exists for the sake of the profit which can be earned, it is easy to see that uneconomic price cutting must be stopped. What will happen to our social and economic order if we allow such price cutting to proceed unchecked? What will happen to the small business man? What will happen to our cherished principal of equal opportunity for all? These are questions which vitally concern the welfare of us all.

The speaker confined himself principally to a discussion of price competition from the standpoint of its abuse. This can be stopped by:

1. Economic remedy or business remedy, and
2. Legal remedy.

As regards a legal remedy the courses of action open are:

1. Price fixing by coöperation among dealers. This must be rejected at once as contrary to our social and economic order.
2. Laws of the type of the Capper-Kelly Bill, which permit a manufacturer to make a contract with a dealer to fix the resale price.
3. Outlaw unfair price competition and unfair price discrimination.

Mr. Dunn is convinced that the Capper-Kelly Bill, if enacted into law, will never be successful unless some law is passed to outlaw unfair price competition and discrimination. As he put it, "There would be no teeth in the law; we must somehow reach the unfair price cutter who will not make such a contract." Under the Capper-Kelly Bill a dealer is not obligated to make a contract with the manufacturer. The dealer would still be able to obtain merchandise by bootleg channels.

Commenting on the law which he suggests, and which is included in this report, Mr. Dunn points out that in no state is there a law on the statute books which outlaws broadly unfair price discrimination and competition. He feels that the law he proposes is the broadest possible under our Constitution. Since a Federal law would apply only to Interstate Commerce, it would be necessary for the same or similar law to appear on the statute books in every state.

MODEL STATE LAW TO OUTLAW UNFAIR PRICE PRACTICES.

An Act to Protect Commerce against Unfair Price Discrimination and Unfair Price Competition.

Be it enacted (insert enacting clause for the State):

Section 1. As used in this act:

(*a*) The term "unfair price discrimination" means any direct or indirect price discrimination between purchasers of a commodity, in the course of commerce in this State, which, after making due allowance for any difference in the grade or quality of the commodity or in the cost of its transportation, is effective or has a dangerous tendency either (1) to unduly lessen competition or (2) to create a monopoly, in any line or part of such commerce;

(*b*) The term "unfair price competition" means any direct or indirect price representation or price cutting in the sale or offer for sale of a commodity, in the course of commerce in this State, which deceives or misleads the purchaser or which is effective or has a dangerous tendency either (1) to unduly lessen competition or (2) to create a monopoly, in any line or part of such commerce;

(*c*) The term "person" means any individual, corporation, copartnership or association;

(*d*) The term "penalty" means a fine not exceeding (insert), for the first offense, and a fine not exceeding (insert), or both, for each subsequent offense.

Section 2. Unfair price discrimination is hereby declared unlawful. Any person who offers or makes or who solicits or accepts an unfair price discrimination shall, upon conviction thereof, suffer the penalty prescribed by this act.

Section 3. Unfair price competition is hereby declared unlawful. Any person who engages in unfair price competition shall, upon conviction thereof, suffer the penalty prescribed by this act.

Section 4. Any person who is injured by unfair price discrimination or unfair price competition outlawed by this act may sue therefor in any state court of competent jurisdiction and shall be entitled to have injunctive relief from such injury and/or to recover threefold the damages sustained, and the cost of suit.

In conclusion, Mr. Dunn urged every one to remember that no law will prevent all price cutting, but that this law to outlaw unfair price competition and discrimination would gradually and progressively remedy it. Precedent would be established slowly as cases arose in the courts, and Mr. Dunn felt that the courts would be inclined to a liberal interpretation of the law.

In the lively discussion which followed Messrs. Seeley, Means, Gesoalde, Monel, Miller, Nichols and others took part. It was brought out that the law, in its application to unfair price competition, would principally be effective where an item was sold below purchase cost.

Mr. Lehman proposed a rising vote of thanks to the speaker and following this the meeting was adjourned.

RUDOLF O. HAUCK, *Secretary.*

PHILADELPHIA.

The January meeting of the Philadelphia Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held at the Philadelphia College of Pharmacy and Science on January 10, 1933.

The meeting was called to order at 8:15 o'clock by President Stoneback and at this time Douglas Krebs and George A. Tushim were proposed for membership, subject to approval.

The largest audience of the present season was on hand to hear Mr. H. J. Anslinger, United States Commissioner of Narcotics, deliver his lecture on the growth, preparation, use and abuse of narcotic drugs.

Mr. Anslinger first projected a moving picture entitled "Dream Flowers," which depicted the growth of the opium poppy and the collection of opium. Another reel followed showing conditions and actual cases of drug addiction in Egypt. A series of lantern slides then accompanied the lecture, showing various methods of smuggling practised in bringing narcotic drugs into this country, cases of addiction especially occurring around San Francisco, and pictures of addicts before and after treatment in various institutions.

Mr. Anslinger estimated that we have about 100,000 drug addicts in this country, and made a plea for adequate state control to assist the work of the Federal Narcotic Bureau, as very few states are accomplishing the control of traffic in narcotic drugs. He also related some of his experiences at the Geneva conference on opium.

At the close of the lecture an interesting discussion began, covering phases pertaining to the dispensing of narcotic drugs. A rising vote of thanks was tendered the speaker.

E. H. MACLAUGHLIN, *Secretary.*

Dr. J. Fred Wolle, for many years a leading interpreter of the music of John Sebastian Bach, who died January 12th at his home in Bethlehem, Pa., was a drug clerk in his earlier years.

EDITORIAL NOTES

A type error occurred in the sketch of President-Elect Robert L. Swain, page 3, January JOURNAL—the date of graduation 1900 should be 1909.

TO RESEARCH WORKERS IN PHARMACY.

Blanks have been sent to those research workers who made reports to the National Conference on Pharmaceutical Research last year, asking for specific information regarding researches intended for publication, to be incorporated in the 1932–1933 Census of Pharmaceutical Research. To permit proper classification of these returns, it is requested that specific and detailed information by products be given in making your response, rather than classification under the general heading, such as "U. S. P. Revision." The nature of the work (chemistry, pharmacology or specific phase being studied) should be stated. If your return has already been submitted, but does not give specific information, please submit a supplemental report. If your name has not been on our lists in the past and you are doing pharmaceutical research intended for publication, please send your name, address, position, rank or title in laboratory, and the names of the specific subjects being studied to the chairman: James C. Munch, 40 North Maple Avenue, Lansdowne, Pa., at once.

FIRST CALL OF SCIENTIFIC SECTION FOR 1933.

Members and Friends of the Scientific Section, American Pharmaceutical Association:

The 81st annual meeting will be held in Madison, Wisconsin, August 28 to September 1, 1933, with headquarters at Hotel Loraine. The Scientific Section expects to hold several interesting sessions and the officers desire your coöperation in planning the program.

As usual, titles and short abstracts of contributions to the program should reach the secretary early (July 1st at the latest), so that a multigraphed list of abstracts will be available at the meeting. At Toronto, action was taken by the Section requiring authors to indicate whether articles would be presented in person or read by title.

The manner of presentation of papers was also discussed and it seemed to be the concensus of opinion that authors often attempt to give too many details in the time allowed (ten minutes), and this sometimes leads to a hasty presentation in which important points are obscured. It is suggested that the following method of presentation be followed as far as possible:

(*a*) A brief statement as to purpose and scope of investigation.

(*b*) A statement of general methods, omitting details except those of particular importance.

(*c*) General statement of results and conclusions.

L. W. ROWE, *Secretary*,
Scientific Section,
c/o Parke, Davis & Company,
Detroit, Mich.

W. J. HUSA,
Chairman, Scientific Section.
February 3, 1933.

FORTY YEARS OF DEANSHIP.

Dr. Frederick J. Wulling has just completed forty years of service as dean of the college of pharmacy of the University of Minnesota. A report of this work and the achievements during these years are to be embodied in a volume commemorating his years of service.

A brief reference to Dean Wulling's works may be found in the JOURNAL A. PH. A. for October 1928, page 994; other articles are published in the volumes for 1930–1932. *The Northwestern Drug News*, for January 1, 1933, gives an interesting history of the development of the College of Pharmacy, which speaks of the activities of the Dean, who has served during four decades. Aside from contributions represented by addresses before pharmaceutical bodies, his contacts with Medical Associations and the public on various occasions and radio talks have been of service.

PERSONAL AND NEWS ITEMS.

Dean Charles H. LaWall was guest speaker at a dinner of the research staff of Merck & Co. on December 13th. The subject of his talk was, "Evolution of Pharmacy," illustrated by lantern slides.

Dr. George D. Beal is to be the speaker at the Founders Day celebration, Philadelphia College of Pharmacy and Science, February 23rd, at which time the degree of Master of Pharmacy will be conferred on him.

A testimonial dinner will be given to **Prof. Frank X. Moerk,** on February 23rd, celebrating the 50th anniversary of services to the Philadelphia College of Pharmacy & Science.

The annual dinner dance and installation of officers of the Ohio Valley Druggists' Association, was held at Hotel Netherland Plaza, January 31st. **George A. Prinzbach** was installed as president for the ensuing year.

John W. Dargavel, former president of the National Association of Retail Druggists, addressed the Minnesota State Board of Pharmacy on February 3rd. The subject of his address was based on matters arising out of his administrative experiences.

Dean Frederick J. Wulling and **Dr. Bernard Fantus,** professor of Pharmacology of the Medical School of the University of Illinois, addressed the Hennepin County Medical Society on January 18th. The subject of the speakers related to prescription writing and compounding.

W. S. Elkin, Jr., has been appointed State Drug Inspector of Georgia. The following members of Georgia Pharmaceutical Association have been appointed to draft a new pharmacy bill: *Chairman,* Thomas Oliver, Charles H. Evans, W. S. Elkin, Jr., T. C. Marshall, R. C. Wilson and M. D. Hodges.

Dr. George E. Follansbee was the principal speaker at the installation dinner dance of the Northern Ohio Druggists' Association. He served on the Committee on the Costs of Medical Care and spoke favorably on the minority report of the Committee.

Dr. A. Richard Bliss, Jr., chief of the Division of Pharmacology, College of Medicine, University of Tennessee, has been elected *National Secretary* of the International Faculty of Science for the United States.

J. L. Hopkins was elected *President* of the Columbia County Association at its last annual meeting in New York City; William B. Daley, Jr., was elected *Secretary* and John J. Rockefeller, *Treasurer.* The *Retiring President* is Frank Seery.

Dr. K. K. Chen, director of Pharmacological Research, Eli Lilly & Co., addressed the Purdue Pharmaceutical Society on December 5th, his subject being "The Chemistry and Pharmacology of Toad Poisons."

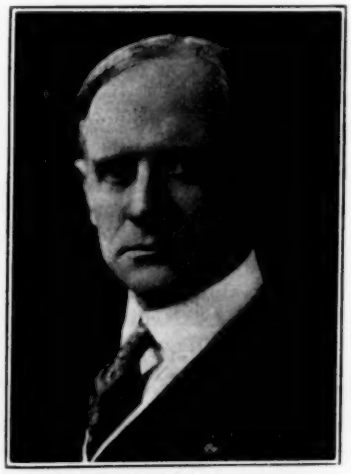
A Fellowship, carrying $1000 a year for four years of study of chemistry at Johns Hopkins University, has been endowed by **Dr. H. A. B. Dunning** of Baltimore, it was announced by **Dr. Neil E. Gordon,** head of the Chemistry Department of the university.

Students in the three upper classes of colleges and universities in Maryland are eligible, the successful candidate to start work at Johns Hopkins next October. The winner is to be picked by a State committee, which will base its choice on scholastic record and personal qualities.

Like similar fellowships at Johns Hopkins, the purpose is "selection and training of chemists especially fitted to contribute to fundamental chemical progress."

PAN-AMERICAN MEDICAL ASSOCIATION.

President, Dr. John O. McReynolds, of the Fourth Annual Congress of the Pan-American Medical Association, has announced that among the speakers of the Congress will



J. O. McREYNOLDS, M.D.

be Dr. Charles H. Mayo, Rochester, Minn.; Dr. Wm. D. Haggard, Nashville; Dr. Dean Lewis, Baltimore; Dr. Franklin H. Martin, Chicago; Dr. H. R. Hartman, Rochester.

It is hoped that President-Elect Franklin D. Roosevelt will make the principal address of welcome to the visiting members of the Congress.

There are nearly forty committees covering various phases of the meeting, including the entertainment and publicity features.

WIDE DISSEMINATION OF "FIGHTING DISEASE WITH DRUGS."

The National Conference on Pharmaceutical Research has arranged to disseminate to the various public libraries of the United States copies of the Symposium, "Fighting Disease with Drugs." There will be in all over three thousand books distributed. The Conference was fortunate in being able to secure the services of the Gaylord Company of Syracuse, New York, to send these books to the various libraries.

NEW RESEARCH LABORATORY.

Appropriate dedication ceremonies have been planned for early in March by Merck & Co., Inc., for their new Research Laboratory at Rahway. Three laboratories have been provided for carrying on pure or fundamental research. Another laboratory will be fitted for bio-chemical research, there will be an adjoining incubator room, and a room has been provided for a pharmacological laboratory. One of the wings of the building will contain a large chemical laboratory, suitable for twelve chemists carrying on applied research and development work. Other features provided include studies on small scale plant operations; an optical and physical laboratory; research on the containers used for various chemicals; and a library containing complete files of technical literature.

Johnson & Johnson have arranged for a contest by which a tour is provided to Europe for four druggists; the contest closes May 31st

OBITUARY.

ALFRED S. BURDICK.

Dr. Alfred Stephen Burdick, president of the Abbott Laboratories, North Chicago, died of pneumonia in the Highland Park hospital,

ALFRED S. BURDICK, M.D.

February 11th. (He would have been sixty-six years of age on February 15th.)

Dr. Burdick was prominent in medical and chemical circles. He received his doctor's degree from Rush Medical College in 1891 and thereafter, for some years, practiced at Dunlap, Ill., Tampa, Fla., Hinsdale and Chicago. From 1899 to 1904 he served as associate professor of medicine at Illinois Medical College.

In 1916 Dr. Burdick became vice-president and in 1921, president of the Abbott Laboratories. During the War he served on selective service board, No. 59. In 1923 he was appointed lieutenant-colonel, medical reserve corps.

Dr. Burdick belonged to many organizations, both as member and officer. He was a member of the AMERICAN PHARMACEUTICAL ASSOCIATION, a former president of the American Drug Manufacturers' Association, and vice-president of the Synthetic Organic Chemical Manufacturers' Association. He was also the author of medical manuals and other works. He belonged to several clubs, among them the Chemists Clubs of Chicago and New York.

The deceased is survived by his wife, Ella Brown Burdick.

EDWARD MALLINCKRODT'S BODY FOUND.

The body of Edward Mallinckrodt, 3rd, of St. Louis, was recovered from the ocean a short distance off Nahant, Mass., on January 25th. The deceased, a Harvard College freshman aged twenty years and son of the head of the Mallinckrodt Chemical Works, St. Louis, was drowned December 29th, with

a companion when their airplane dropped into the sea. His father came immediately and was present at the search for the body until January 22nd, when he returned to the family home. The medical examiner, Dr. Nathaniel Breed of Lynn, issued a certificate of death by drowning, and the body was removed to St. Louis. The body of the companion in the airplane, Donald McKay Frost of Boston, was recovered two weeks earlier.

JOHN B. EBBS.

John Buddington Ebbs, the oldest druggist in Waterbury, Connecticut, died January 28th, at St. Mary's Hospital, aged 71 years. Mr. Ebbs had been ill only a few days, having suffered a shock on Thursday, January 26th.

Mr. Ebbs was a native of London, England, but had been a resident of Waterbury for the past 45 years, becoming associated with the North End Drug Company soon after his arrival in the city. During the years from 1897 to 1906, he served as treasurer of the Connecticut Pharmaceutical Association, and was a former member of the state Pharmacy Commission. Mr. Ebbs was one of the original trustees of the Connecticut College of Pharmacy, and one of the six founders to whom the charter for the College was granted. At the time of his death he was secretary of the Board of Trustees of the College.

JOHN C. KRIEGER.

We regret not having had information before now relative to the death of our fellow-member, **John Christian Krieger,** of Salamanca, N. Y. He died October 12th, and had been a member of the AMERICAN PHARMACEUTICAL ASSOCIATION since 1908. Mr. Krieger had been a resident of Salamanca during all of his life and was highly regarded as citizen and pharmacist. The home paper closed a tribute to him in the following words: "John C. Krieger was a keen, upright business man, a true friend, a good citizen, and because of these qualities was loved by all who knew him. He was a loyal, loving and generous husband and father, and it is because of these traits of character that he will be best remembered by those who knew him most intimately."

The deceased was born March 8, 1870, in Salamanca. In early youth he entered the drug business and graduated from the College of Pharmacy, University of Buffalo. He was eminently successful as wholesale and retail druggist. He founded the Krieger Drug Company and was manager for many years of Ellicott Drug Company, and established other drug stores, all of which were marked by Mr. Krieger's activity and ability. Surviving Mr. Krieger are his wife, Jennie F. Krieger, a daughter, Miss Louise, and three sons—A. E., John G., and G. Hubert.

J. J. THOMSEN.

John J. Thomsen, at one time prominent in the drug and chemical trades of Baltimore, died suddenly of a heart attack on February 3rd, at his home in that city. The deceased was a son of the late John J. Thomsen, a member of the old wholesale drug firm of Thomsen & Muth. The deceased was seventy-five years old and a graduate of Harvard University. For many years he was a member of the Maryland Club. His wife and a brother, Hammond J. Thomsen, survive.

Members of the AMERICAN PHARMACEUTICAL ASSOCIATION were saddened by the news of the death of Maxwell Poerstel, son-in-law of Dr. and Mrs. S. L. Hilton on December 22nd, after a brief illness resulting from a fall, followed by pneumonia. The deceased leaves a wife and three small children; sympathy is expressed to the members of the family.

Mrs. D. O. Haynes, widow of the late D. O. Haynes, who was a publisher of drug and chemical journals, died February 5th, at Tampa, Fla. Her home was at Garden City, L. I. Mrs. Haynes was seventy-three years old and a native of Detroit. Two daughters and three sons survive, one son, William Haynes, being publisher of a chemical trade journal.

SEEK BAN ON PROMISCUOUS DISTRIBUTION OF BARBITURIC ACID DRUGS IN WISCONSIN.

A ban on the promiscuous sale by drug stores and others of a number of dangerous drugs compounded from barbituric acid will be sought by the Wisconsin Pharmaceutical Society, according to an announcement by William M. Rheineck, Milwaukee, chairman of the society's legislative committee, who said the move by the druggists has the support of many Wisconsin physicians.

SOCIETIES AND COLLEGES.

BRANCH OF AMERICAN PHARMACEUTICAL ASSOCIATION ORGANIZED IN PORTLAND.

Portland members of the AMERICAN PHARMACEUTICAL ASSOCIATION held an organization meeting in the Library of the North Pacific College of Oregon, January 20th. Further report on this Branch will be made in March JOURNAL.

MADISON A. PH. A. MEETING.

The time, headquarters and local secretary of the 1933 convention of the AMERICAN PHARMACEUTICAL ASSOCIATION were recently approved by the Council. The meeting will be held the week of August 28th to September 2nd, at Madison, with the Loraine Hotel as headquarters. Emerson D. Stanley has been elected *Local Secretary*.

Mr. Stanley, a native of Milan, Michigan, attended the University of Wisconsin from 1925 to 1928, after having had his early training in Michigan. He earned his way by working in Keefrey's Drug Store, and purchased the First Central Dispensary, a professional pharmacy, in 1928, and has been actively engaged in business since.

At a joint meeting of the Madison pharmaceutical organizations and the faculty of the University School of Pharmacy, Mr. Stanley was chosen local secretary. At this meeting an executive committee was created representing the different groups: Oscar Rennebohm, president of the Wisconsin Pharmaceutical Association was elected *Chairman* of this and similar joint committees; Charles C. Charmley, *Permanent Secretary* of the joint meetings; Franklin J. Bergman, *Student Representative;* Edward J. Ireland, *Faculty Representative;* A. F. Menges, *Retail Druggist;* and Emil A. Hayden, *Wholesale Druggist.*

This executive committee met with Mr. Stanley, January 12th, acting in an advisory capacity in appointing committee chairmen. The complete committees will be appointed in the near future. At this meeting the executive committee resolved itself into the convention committee and will hereafter be known by that name. The committee chairmen appointed are: *Entertainment*, Richard G. Weiss, hospital pharmacist; *Registration*, Arthur H. Uhl, U. W. Pharmacy faculty; *Transportation*, R. J. Tiedeman, druggist; *Hotels and Garages*, Ernest G. Kuenzi, hospital pharmacist; *Publicity*, Ralph W. Clark, U. W. Pharmacy faculty and secretary of Wisconsin Pharmaceutical Association; *Treasurer*, Emil Hayden; *Travelers*, Carl Beckler, Herbert Schultz, Joseph Hall, Jack Scheiderer, Fred Buening, Joe Schaffer and Dale Ruedig.

TESTIMONIAL DINNER TO PRESIDENT-ELECT ROBERT L. SWAIN AND SECOND VICE-PRESIDENT-ELECT, DR. JOHN C. KRANTZ, JR.

The pharmaceutical organizations of Maryland joined hands on February 7th in tendering to President-Elect Robert L. Swain and Second Vice-President-Elect John C. Krantz, Jr., of the AMERICAN PHARMACEUTICAL ASSOCIATION, a testimonial dinner. A large number from Baltimore, other parts of Maryland, and a number from near-by states, attended the delightful function.

Music for the occasion was provided by the daughter and sons of Secretary E. F. Kelly. President L. M. Kantner, of the Maryland Pharmaceutical Association, presided as toastmaster. The banquet was served at the Emerson Hotel.

Many messages were received, among them one from Governor Ritchie who expressed his regret at not being able to attend on account of legislative sessions.

Among the speakers of the evening were President W. Bruce Philip of the A. PH. A., Dr. Robert H. Riley, director of Health for the State of Maryland, who gave a history of the Maryland State Department, and the important services rendered by the honored guests of the evening, and Dr. E. F. Kelly. First Vice-President-Elect Robert P. Fischelis, in his remarks, referred to the happy condition of pharmaceutical law enforcement in Maryland. Walter L. Morgan, former president of Delaware Pharmaceutical Society, paid tribute for himself and pharmacists of Delaware. Former AMERICAN PHARMACEUTICAL ASSOCIATION presidents, S. L. Hilton and E. G. Eberle, made brief remarks. Others sent messages of appreciation and congratulation.

Dean A. G. DuMez, of the School of Pharmacy of the University of Maryland, expressed his regard and on behalf of the School. Secretary E. F. Kelly spoke at length relative to the honored guests, stressing their accomplish-

ments and outstanding services, and on behalf of the Committee presented to each of them a beautifully engraved mortar and pestle. As representative of the Committee, he presented Mrs. R. L. Swain and Mrs. John C. Krantz, Jr., each with a beautiful bouquet of roses.

The president-elect responded, expressing his heartfelt appreciation of the honor bestowed, of the fraternal and other relationships which strengthened him in his work; he pledged his services to President Philip and was hopeful that the support given him by members of the profession would enable him to carry on. He was followed by Vice-President Krantz, who spoke about the opportunities he had had in studying under Drs. Culbreth, Base, Kelly, Karash and Gordon, and how this contact molded the achievements of his life. He closed with a beautiful tribute to Mrs. Krantz.

Wm. F. Reindollar arranged the details of the dinner and he was assisted by other members of the Committee representing the various pharmaceutical bodies of Maryland, among them—L. M. Kantner, Marvin R. Thompson, Lloyd C. Richardson, E. F. Kelly, L. C. Rettaliata, Aquilla Jackson, William F. Brown, George M. Armor.

We are indebted to **C. Jelleff Carr,** *secretary* of the Baltimore Branch, A. PH. A., for the data of this report.

OFFICERS OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

At the meeting of the American Association for the Advancement of Science, held in Atlantic City, the following officers were elected: *President,* Henry Norris Russell, Princeton; *General-Secretary,* Burton E. Livingston; *Treasurer,* John L. Wirt, Washington, D. C. Dr. John J. Abel was president of the meeting.

MEETING OF PHILADELPHIA PHYSICIANS AND PHARMACISTS.

The Philadelphia County Medical Society held a joint meeting with the Philadelphia Association of Retail Druggists, January 25th. Addresses were presented by:

John M. Woodside, Ph.G., member of the state board of pharmacy, "Pharmacy's Part in Safeguarding the Public Health."

Clarence A. Pickett, Ph.G., secretary of the Philadelphia Association, "The Constructive Influence of Retail Druggists' Association."

John C. Walton, Ph.G., president, Pennsylvania Pharmaceutical Association, "Professional and Commercial Aspects of Pharmacy."

Dr. George C. Yeager, "Dispensing by Physicians."

F. W. D. A. POSTPONES MEETING.

The Federal Wholesale Druggists' Association has postponed to March 7th and 8th the midyear meeting to be held in New York City. The meeting will be held in the Waldorf-Astoria Hotel. The first session, Tuesday forenoon, will be devoted to a conference of the active and associate members: President O. J. Cloughly asks that the attendance of both classes of members be large, as the discussions will have to do with matters of vital importance

PHILADELPHIA DRUG EXCHANGE.

The following officers of the Philadelphia Drug Exchange were elected: *President,* Harrison S. Hires, of the Charles E. Hires Company; *Vice-President,* Benjamin S. Thorp; *Secretary* (reëlected), Joseph W. England; *Treasurer* (reëlected), F. L. Bodman; *Directors* (reëlected), J. Mervin Rosenberger, H. K. Hineline, H. H. Whyte, Walter V. Smith and E. L. Brendlinger; (new members), John F. Belsterling, Raymond G. Anderson and Paul S. Pittenger.

The Exchange held its annual dinner in the Penn Athletic Club, January 26th. The speakers were Col. Samuel P. Wetherill, Jr., on "City Planning and Budgeting," and Chairman E. Fullerton Cook, of the U. S. P. Revision Committee on "The United States Pharmacopœia and the General Public."

DINNER OF HUDSON COUNTY DRUGGISTS AND DOCTORS.

The Hudson County Retail Druggists Association, Inc., extended a dinner to physicians of Hudson County on February 21st, to foster a closer relationship between pharmacy and medicine.

OHIO ASSOCIATION.

Ohio State Pharmaceutical Association met in Columbus, January 25th–26th. Reports were made by the officers and committees and discussions were held on Old Age Pension, Medical Health Insurance, Classification of Pharmacies and Drug Stores, Uniform State Narcotic Law. Governor White and members of the State Legislature attended the dinner on the 25th; Attorney General John W. Bricker was the speaker of the evening.

LEGAL AND LEGISLATIVE.

SALES TAX PLAN AS ENFORCED BY CANADA OUTLINED.

ARGUMENTS IN FAVOR AS WELL AS AGAINST SYSTEM ARE REVIEWED IN REPORT BY SUB-COMMITTEE OF HOUSE.

The manufacturers' sales tax as applied in Canada produces substantial revenue, is easily administered and is "painless" to the taxpayer, but it violates the principle of ability to pay, and has other defects, the sub-committee of the House Committee on Ways and Means which has been investigating double taxation said in its preliminary report, just made public. A summary of the arguments for and against the sales tax, included in the sub-committee's report, follows in full text:

ARGUMENTS IN FAVOR.

The principal arguments that have been advanced by the proponents of the limited manufacturers' sales tax include the following:

1. It produces substantial revenue.
2. The cost of collection is low.
3. It is easy to administer.
4. It has a broad base, permitting all citizens to contribute in some measure to the support of the Government. The income tax, on the other hand, touches only a very small group of the whole body of citizens.
5. It is a painless tax, since it is not imposed directly upon the consumer but instead is levied on manufacturers' sales, and if it is passed on it does not appear in the retail price as a separate item.
6. As a tax on buying power, which is always present to a certain degree, it is a good revenue producer in bad times as well as good times.
7. It is paid when the taxpayer has money to spend.
8. As the rich buy more than the poor, and pay more for what they buy, they will contribute more tax.
9. The rate is low and uniform, and most necessities are exempt.
10. Pyramiding is eliminated, so that the tax is paid but once on the sale of any given article.
11. The tax will not affect business any more adversely than some other form of taxation.

ARGUMENTS AGAINST.

Among the arguments advanced by the opponents of the Canadian sales tax the following probably are the most outstanding:

1. It is a tax on consumption, and to the extent that it is shifted to the consumer it increases the cost of living.
2. When borne by the seller the tax discriminates unfairly in favor of business with small total sales and high profits and against those with large sales and small profits, and is, in effect, a tax on gross income under such circumstances.
3. When borne by the retailer, it imposes the sole burden on him, thus discriminating in favor of manufacturers and wholesalers.
4. When shifted to the consumer, it is a gross violation of the principle of ability to pay.
5. As between taxpayers with equal incomes, the sales tax falls most heavily on those with the greater number of dependents.

Although the rich man consumes more than the poor man, and buys more expensive goods, the larger tax that he pays is not in proportion to his wealth.

7. The sales tax is an income tax in reverse, since it is levied on outgo instead of income.
8. The tax being an element of wholesale cost, the profit of the retailer includes a profit on the tax. Thus the tax takes more dollars out of the pockets of the consumer than it puts into the hands of the Government.
9. Being an easy revenue producer, it is likely to be conducive to governmental extravagance.
10. Administration of the tax is not as simple as is supposed, especially where there are many exemptions.

STATE LEGISLATION.

Oklahoma H. B. 43 proposes to prohibit the possession and distribution of veronal, barbital, luminal, chloral hydrate, bromidia, somnos, marihuana, Indian hemp, hasheesh and loco weed, except on the prescription of a lawfully authorized practitioner of medicine, dentistry or veterinary medicine. H. 48, to amend the law, authorizing the Governor to prescribe regulation for the sale of alcohol to hospitals, clinics, laboratories and other scientific institutions, proposes that alcohol purchased from federal bonded warehouses or

from wholesale drug houses, in compliance with the laws of the United States, by hospitals, clinics or laboratories for routine medical use, may be transferred without a permit being first secured from the Governor or without the purchaser being bonded under the provision of the law.

South Dakota H. 3, to amend the pharmacy practice act, proposes (1) to permit persons other than registered pharmacists to sell in original packages patent or proprietary medicines and (2) to permit any person of good moral character who conducts a retail place of business to be licensed annually by the state board of pharmacy to sell in original packages simple household remedies.

A California bill permits physicians in good faith to prescribe or furnish narcotic drugs to patients suffering with incurable diseases, ailments or injuries other than narcotic addiction, and to require physicians prescribing or furnishing narcotics to habitual users to report that fact by registered mail to the division of narcotic enforcement.

A Georgia bill seeks to amend the pharmacy practice act, proposes to require all applicants for registration as pharmacists to be graduates of schools of pharmacy recognized by the board of pharmacy and, in addition, to have twelve months of practical experience in a place where prescriptions of physicians are dispensed by licensed pharmacists. Under the present law, applicants can be licensed after examination if they have had thirty-six months' actual experience in a pharmacy or have graduated from a school of pharmacy.

A Missouri bill proposes that (1) all examinations required by law as a condition precedent to the right to practice any profession shall be in writing and all examination papers shall be kept on file in the office of the proper board, subject to public inspection, for at least one year; (2) a rejected applicant shall have the right to appeal to the courts and in that proceeding the board shall submit a certified copy of the applicant's examination papers; and (3) three examiners each for dentistry, chiropody, osteopathy, chiropractic, nursing, optometry and pharmacy, be appointed by the board vested by law with the authority to license, the finding of the examiners to be conclusive on the board.

Arkansas H. B. seeks to repeal the Inspection Tax on drug stores.

Arizona proposes a sales tax of 1/3% upon necessities and 2% upon non-necessities.

California is considering repeal of the Narcotic Enforcement Act and to amend the Drug Addict Act; a bill is proposed to outlaw the Trading Stamp and repeal the Anti-lottery Trading Stamp; seeks to tax chain stores up to $35.00 on each store over twenty; to further restrict sale of narcotics; to transfer the functions of narcotic enforcement to the board of pharmacy.

Colorado seeks to enact an anti-trading stamp law; provide a 5% sales tax. A tobacco tax is being considered in Arkansas, Colorado, Georgia, Iowa, Oklahoma, Oregon and in other states.

Illinois is considering a chain store tax; also Georgia, Iowa, Kansas, Maine, Massachusetts, Minnesota, Nebraska, New York, Washington, West Virginia and other states. These taxes vary greatly.

Kansas seeks to prohibit the planting of cannabis.

Various phases of narcotic legislation are being considered in quite a number of states. A suggestion is made that great care should be exercised in framing legislation that will add materially to expenses of the respective states, when the Federal law is sufficient. Such legislation may mean an additional burden; secretaries of state associations have been supplied with suggestions that have received careful consideration by the National Drug Trade Conference.

Sales, special or both types, are having consideration in all states; additional income by states and by the Federal Government is required, but legislative committees have responsibilities, for the many items of drug stores are very apt to become burdensome—there should be fairness; it is much easier to impose taxes than to repeal them.

SOUTH DAKOTA OWNERSHIP BILL.

A bill has been introduced in the legislative assembly of South Dakota, seeking an amendment to existing laws which would provide that no person other than a registered pharmacist could open or conduct a pharmacy for retailing drugs, medicines or poisons. The bill provides that any person not being a registered pharmacist, who shall compound or dispense drugs or medicines or poisons will be guilty of a misdemeanor, and upon conviction be punished by a fine of not less than $50.00, nor more than $100.00, or by imprisonment in the county jail.

NEW YORK PHARMACY OWNERSHIP CASE WILL BE TAKEN TO U. S. SUPREME COURT.

The decision of the New York Court of Appeals nullifying the Pharmacy Ownership Law and making it legal for any corporation or individual, whether pharmacist or layman, to own and operate a drug store by having a registered pharmacist in charge, will be appealed to the United States Supreme Court. Meanwhile, no certificate of registration will be issued to a non-pharmacist or a corporation for the conduct of a pharmacy.

The Pennsylvania law, the New York State Pharmaceutical Association, appearing in the action as *amicus curiæ*, points out, carried a provision which made it impossible for existing corporations within the state to open additional stores. This is not true of the New York law, under which it was possible for corporations owning drug stores in the state at the time the law went into effect to purchase, or open new outlets.

It has been further noted by the Association that the Pennsylvania law was admittedly a measure designed to curb the growth of chain systems. The New York law was passed as a public health measure. While the bill was being debated in the legislature, both physicians and pharmacists appeared to testify that the law was needed to supply adequate protection to the public health.

NEW MEXICO PHARMACEUTICAL ASSOCIATION.

President David L. C. Hover in a letter to the members expresses his opinion that a sales tax in some form will be put on the legislative books. He is in favor of a general sales tax, at a small rate with no exceptions granted to any class that does not at present carry a sales tax. He is not in favor of special taxes and, on general principles, he is against an income tax; if this is necessary, such tax should fall heaviest on those that pay no property tax.

MEDICINAL LIQUOR BILL ADVANCED.

A sub-committee of the House judiciary committee has approved the bill introduced by Representative Emanuel Celler of New York to remove restrictions on the prescription of medicinal liquor. The bill would remove the limit on the amount to be prescribed for any one person, leaving this to the discretion of the physician, and would remove requirements as to disclosing ailments. A system of stamps to be affixed to prescriptions by the physicians before they may be filled is provided as a guard against counterfeiting. The bill has the support of the American Medical Association and was suggested by the Wickersham commission.

BOOK NOTICES AND REVIEWS.

Organic Chemistry. By G. ALBERT HILL, Professor of Organic Chemistry, Wesleyan University and LOUISE KELLY, Professor of Organic Chemistry, Goucher College. P. Blakiston's Son and Company, publishers. VIII + 564 pages.

The authors state in the preface, "This text is planned for an elementary, but comprehensive one-year course in organic chemistry. It provides a survey of the subject for the student who will go no further in the study of organic chemistry and establishes a foundation not only for those who will study the subject more intensively, but also for those who plan to specialize in medicine or the biological sciences." A special feature in the text is a brief introductory chapter dealing with the historical development of organic chemistry. The subject-matter is presented in a systematic manner and in a form which should facilitate the comprehension of fundamentals by students. The reagents and conditions necessary to bring about reactions are treated more fully than is usual in most organic texts of an elementary character. The nomenclature employed conforms with standard present-day practice. Biochemical and industrial applications of organic chemistry and the increasing importance of catalytic processes are emphasized. Information concerning the physiological action of many compounds is given. Questions appended to each chapter should guide the student in review and the problems should aid in the understanding of stoichiometrical relationships. The text is well written in a concise form and is notably free from errors in formulas and fact.

From the viewpoint of the pharmaceutical

chemist, the number of compounds considered which are employed in pharmacy is greater than might be expected in a text of this character. These substances are not referred to as pharmaceutical materials, however, and their use in pharmacy and production by the pharmaceutical industries is not pointed out. In a number of cases, the text might be improved by stating that a pharmaceutical preparation of a substance is used medicinally for certain purposes rather than to imply that the substance is used as such, *e. g.*, avertin, epinephrine. The statement of the physiological activity in a text of this character should be in general terms; thus the assertion that a certain commercial product "is an almost perfect urinary antiseptic" is open to question. Again the description of toxic symptoms such as those of phenol poisoning might advantageously be left to texts on toxicology. Likewise, the description and explanation of the operation of a polariscope seems out of place in a text which does not consider methods such as the determination of the melting point, boiling point and refractive index of substances. The text may offer certain advantages for use in the teaching of pharmacy students in schools which do not offer an applied course dealing with organic pharmaceutical substances in addition to the basic course in organic chemistry.—GLENN L. JENKINS.

Handbuch der Pharmakognosie. By A. TSCHIRCH, with many coöperators. Part 12. Price of each part 8 marks. Many illustrations in text, tables, charts, etc. Publisher, Bernard Tauchnitz, Leipzig, 1933.

The author, an honorary member of the AMERICAN PHARMACEUTICAL ASSOCIATION, is known as an outstanding pharmacognosist and a review of his master work might be embodied in the statement that no comment is needed other than that it is his work in which he is assisted by many experts. The publishers are well and favorably known, so that the completed work will be a comprehensive source of information on all related subjects in volumes that reflect the printer's art.

The part under discussion is largely historical, biographical and geographical, giving sources and origins of drugs. The contributions of Greeks by their voyages and discoveries are intensely interesting. Writing of the Alexandrian period, Agatharchides Knidios is mentioned in connection with Arabian species and edible plants, description of the Red Sea country and Egypt in general. Extended reference is made to a Greek merchant, Arrian by name. The beginning of the direct voyages to India is stated to be in the first century A.D. He described ports and routes and many drugs and spices. Evidently the name "Periplus" was given to several geographical records of antiquity; in one of these mention is made of many drugs still in more or less common use, as—aloes, olive oil, cassia, cotton, pepper, myrrh, styrax, indigo. It was Arrian also who was among the first to make known botanicals in commerce.

Ports are named together with the drugs that may be obtained or exchanged—imports and exports; thus, Malao exported myrrh, cassia; Socotra, dragon's blood, etc.

A section is devoted to the period between "Homer and Hippokrates." Materia medica and actions are described, for examples, emetics—hellebore, scammony; anthelmintics—cedar oil, juniper; for wounds—tar, myrrh; styptics—galls, mullein and so on through a long list of drugs and their properties.

The beginnings of pharmacognosy are traced from the root gatherers and cutters to later periods—brief sketches of Theophrastus, Dionysius and contemporaries are most interesting studies. Another division deals with later periods wherein "Nikander, Andromachus, Dioskurides" are given much attention, together with their knowledge of materia medica.

The Greek section is followed by the Roman period from the time of the destruction of Carthage and, in interesting sequence, the part other nations and countries had in the development of pharmacognosy are presented.

The purpose of the comment is not for reviewing this outstanding work, but to give a few references to the lines which are followed in this part. Other parts of the *Handbuch* have heretofore been mentioned in a more or less related way; part 10, for example, is a biographical bibliography of 2400 names wherein reference is made to each person, his activities, etc.; throughout, the illustrations, maps, charts are instructive.

The co-workers with Dr. Tscirch are: Dr. P. Casparis, Prof. E. Gilg, Dr. Ed. Fischer, Pharmacist H. Kutter, Dr. P. N. Schürhoff, Dr. H. Flück, Prof. W. Himmelbaur, Dr. A. von Lingelsheim, Dr. L. Winkler, Dr. L. Kofler, Pharmacist T. Tugendhold, Julius Grossmann, wholesale druggist; Prof. J. A. Häfliger, Dr. H. Marzell and Dr. E. O. von Lippmann.